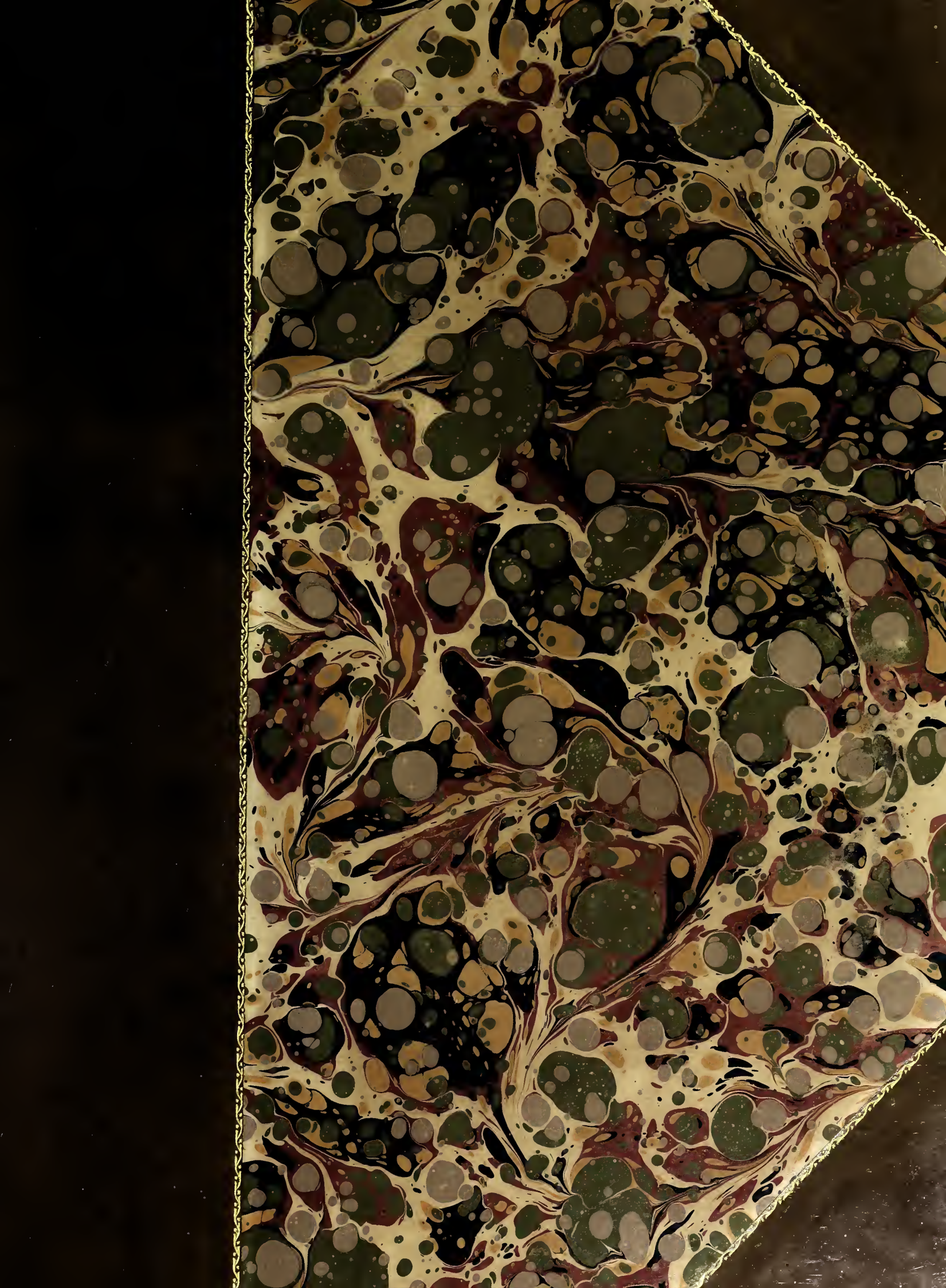

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PRACTICAL

PERSPECTIVE,

EXEMPLIFIED ON

LANDSCAPES.

By THOMAS NOBLE,

PROFESSOR OF PERSPECTIVE.

ENGRAVED BY JOHN CLARK.

THE SECOND EDITION.

**WITH AN ESSAY ON THE PRACTICE OF TAKING VIEWS,
AND MANY OTHER CONSIDERABLE ADDITIONS AND IMPROVEMENTS
BY THE AUTHOR.**

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STANZAS ON PERSPECTIVE:

ADDRESSED TO

THE RIGHT HONOURABLE THE COUNTESS OF OXFORD;

WITH A COPY OF THE FIRST EDITION

OF THIS WORK.

'Ere fair **PERSPECTIVE'S** *gentle laws were known*
Would bold Design his daring forms display,
In colours brighter than the roles of May;
Yet without order was his tablet strewn,
Nor were the tender mists of distance shewn,
Nor objects lessening thro' the lengthening way;
But, as in dazzling noon's solstitial ray,
Deluged with waves of light th' uncertain **LANDSCAPE** *shone.*

'Twas then **GEOMETRY,** *dark, thoughtful sage,*
Sent from his cell recluse his loveliest child
PERSPECTIVE, *who had all his toils beguil'd;*
For she alone could to soft cares engage
His anxious mind: she, when fair Nature smil'd,
Would still, with mimic scenes, his tedious love assuage.

Straight, in proportions just, the objects rise;
The long receding vista slowly fades
In the far, faint, horizon; while the shades
Of intermingled columns, with surprize,
Rivet upon one plane th' admirer's eyes,
As tho' a real distance did pervade
The portico, the lessening spire, the glade,
Woods and retiring hills, that melt into the skies

But ah! too like her Sire, the nymph unlov'd
Wander'd, while lawless scenes usurp'd her name:
Nor knew she where she might protection claim,
'Till Sense and Taste in OXFORD'S *figure mov'd.*
Then felt her bosom hope's enlivening flame,
That Art would keep her laws by Beauty's lips approv'd.

THOMAS NOBLE.

PREFACE.

THE necessity of easy PRACTICAL INSTRUCTIONS in Perspective is universally acknowledged, and it is to be wondered that nothing of this kind has been before attempted. Masters of Drawing, indeed, frequently complain of the disadvantage of teaching an Art without its principles, and endeavour to let their Pupils supply the want of Science by a habit of copying from correct Drawings. But experience proves that such a system is erroneous. Few of the most successful Scholars of such a practice, unless endued with more than common perception, become capable of taking a View from Nature, or of designing from Imagination: to copy a Print or Drawing is their highest attainment, and even in doing that, the taste and delicacy of the Pencil can hardly atone for errors which are continually apparent in their Performances.

Perspective is the Grammar of Painting, and it is as impossible to be a Painter without attention to it, as it is to be an Author without regarding the rules of Syntax. The folly of resorting to an obsolete language, for the grammatical rules of our vernacular tongue, has long since been exploded; and it is assuredly time to separate the Painters' Grammar from a long and tedious investigation of recondite truths. Indeed, were that close Geometrical investigation, which involves the study of Perspective at present, more necessary than it is even generally thought to be, yet would it be proper to endeavour to find a shorter and more pleasing path for the Man of taste, or for him who seeks relaxation in the labours of the Pencil from more urgent occupations.

Science and Art are generally the provinces of different Men, because they demand different faculties of the mind. Instead therefore of filling volumes, with elaborate Science, it is certainly more useful to Mankind, that certain parts should be selected, and applied to their appropriate Arts. Execution would not then be impeded by useless study, nor would the Artist continue to reject that knowledge, which is absolutely necessary for the perfection of his talents.

Of such a nature is the present design. In it will be found enough of the Theory of Perspective to enable the Artist to delineate his Landscape with truth and accuracy; and as few instructions are given without such examples as are continually the subjects of Drawing, the Pencil is kept in practice, while the understanding is cultivated; taste and the powers of execution are exercised, while the judgment is informed.

A very small number of Geometrical Problems, properly selected, will be found sufficient for every purpose in Landscape Perspective. One Plate for explanation will make the Learner acquainted with the lines and points by which this Science performs its operation; and a single demonstration will make clear to the dullest understanding the reason of those proportions on which the practice of Perspective is founded.

I consider references as very preferable to repetition; they create a memory, where that mental principle of Science is wanting, and they recal former operations which explain each other, and thereby make an easy way to the understanding. They will be found to be numerous. He whose perception is strong, and memory tenacious, may think their number troublesome---he has only to neglect them. To many, the Author believes, he had better appear somewhat troublesome than in the least obscure.

The support of a candid Public, ever ready to patronize that which tends to the improvement of the Arts, is respectfully solicited; and with some confidence; since neither care nor exertion has been spared to render this work adequate to the utility of its design, and thereby worthy their attention.

THOMAS NOBLE,

Blackheath, 1809.

ADVERTISEMENT

TO THE

SECOND EDITION.

THE Author of this Work when he first presented it to the Public endeavoured to shew that a Science, which had so long been secluded from the Artist and the Pupil of taste, was not incapable of being rendered simple and accessible. His plan was to fix it upon its own principles, and while he freed it from the irksomeness of Geometrical demonstration to set forth its general truths in a manifest and incontrovertible light. His success in this undertaking has been universally acknowledged: and rival publications have started forth to participate in his merit. The course he had taken was, however, not so open as his followers seem to have imagined: he had not rejected, but simplified Science: he had not exhibited a mere book of practice without elements; and, therefore, when they pretended to imitate his labours, they should not have omitted that foundation, which he had laid in the truths of proportion, nor that arrangement which by its form alone elucidated the principles of the Science. To a first attempt at reducing a branch of Mathematical knowledge to so simple a structure, many improvements might undoubtedly have been added; and he regrets that all those improvements are left to his own exertions.

In this second Edition it will appear that he has not swerved from his duty. The whole doctrine of vanishing lines and their central points will now be found exhibited in one short, but perspicuous, survey of the subject; and their analogy with the Horizontal line and point of sight, will be seen correctly exemplified by an additional plate. The principles, on which the delineation of Shadows in perspective is determined, are explained in a few general maxims, which are accompanied with distinct diagrams: from these elementary precepts the whole of the practice of shadows is deduced in a new and easy manner. Still something appeared to be wanting. The young Artist in taking a view might still be at a loss how to direct his hand

by

by the theory and *instrumental* practice he had acquired: *An Essay on the application of Perspective to the practice of taking views*, therefore, concludes the work; and, conducting the Student to the field, instructs him how his acquirements are to influence his judgment and correct his eye.

In bringing his work a second time before a candid Public in so improved a state the Author feels assured of its favourable reception; and ventures to hold forth the promise of a work upon a more extended scale, that may exhibit the contents of the fifth section of this, in a more enlarged and scientific manner.

T. N.
Blackheath, 1809.

INTRODUCTORY

INTRODUCTORY PROBLEMS OF GEOMETRY.

(See the Title Plate.)

FIG. 1. A PERPENDICULAR is a right line directly standing upon, or falling beneath, another right line, without inclining one way or the other: thus, A D is perpendicular to B C, and (Fig. 2.) E D or E A is perpendicular to B C*.

I. *To draw a right line perpendicular to a right line at a given point in it.*

B C (Fig. 1.) is the given line, in which A is the given point. Take the points B and C in the given line, equally distant from A. With any opening of your compasses at B, as a center, strike the arc of a circle towards D; with the same opening of your compasses, and at C as a center, cross the former arc at D: from D, the point in which the arcs meet, draw D A, which will be perpendicular to C D.

II. *To let fall a perpendicular to a given line from a given point.*

B C (Fig. 2.) is the given line: A is the given point. From A, as a center, describe an arc of a circle that may cut the given line in two points, as in B, C. At B and C, as centers, describe the intersecting arcs at D, as in the last problem: join A and D. Then the line A D, that is, either the upper line A E, or the lower line E D, is perpendicular to B C.

* It is manifest that B A or C A, in Fig. 1, is perpendicular to A D, because if the side of the paper be turned, either B A or C A stands directly upon or falls directly beneath A D. In like manner, E B or E C, in Fig. 2, is perpendicular to E D or E A. Hence it follows, that any lines drawn *to*, or only *towards*, each other, without any sloping or inclined direction, are reciprocally perpendicular.

III. *To draw a Perpendicular to a right Line, at or near one extremity of it.*

C A is the right line (Fig. 3.) and A is a point at or near one extremity of it. At any point, not in the right line, as the point B, and with the distance B A, describe more than half a circle, cutting A C in C. Through C and B draw a right line, cutting the described arc in D, join D A: then is D A the perpendicular required.

IV. *To bisect, or divide, a given Line in two equal Parts.*

A B (Fig. 4.) is the given line. At A and B, its extremities as centers, describe the intersecting arcs towards C and D. Join C D, and then will A E be equal to B E.

An Angle is the inclination of one line to another. A line, perpendicular to another line, is said to be at *right angles* with it; and the angle or angles, it makes with it, are called *right angles*. An angle *less* than a right angle is called an *acute angle*. An angle *greater* than a right angle is an *obtuse angle*.

V. *To make an Angle equal to a given Angle.*

C A B (Fig. 5) is the given angle, and D E is a line on which a similar angle is to be made. At A and at D for centers, describe arcs of circles with the same opening of the compasses, and make E F equal to B C. Draw D F, and the angle F D E will be equal to C A B.

VI. *To bisect, or divide, a given Angle into two equal Parts.*

B A C (Fig. 7) is the given angle. At A, as a center, describe any arc as B C. At B and C, as centers, describe the intersecting arcs at D. Join D A. Then D A B and D A C will be equal angles.

VII. *To draw a Right Line making any given Angle with another Right Line.*

A B is one right line, and A is the intended angular point. Open the Sector* and take any distance from 60 to 60 on the lines of Chords, marked thereon C, and therewith describe an Arc† as B E D. On the Sector take the width of the given angle (suppose 38°) from 38° to 38°, and lay it from B to E, draw E A. Then E A B is an angle of 38°.

If the given angle be obtuse, make two acute angles, which together may be equal to the given obtuse angle. Thus the obtuse angle D A B (Fig. 8) is composed of the two acute angles B A E and E A D, one containing 38° and the other 57°, and therefore itself contains 95°.

PARALLEL LINES are such as would never meet, however far they might be continued either way.

VIII. *At a given Point to describe a Line parallel to a given Line.*

A B is the given line (Fig. 6.), and C is the given point. Draw B C, and make the angle B C F equal to the angle A B C. The line C F will be parallel to A B.

PROPORTIONAL LINES are such as have similar relations to each other, in the same manner as proportional numbers in the rule of three; thus 3: 5: : 6: 10, may represent lines of different length, as well as pounds, cwts. &c. then it will be as a line of three yards, or any other measure, is to a line of five yards, so is a line of six yards, to a line of ten yards.

* The Sector is a ruler that doubles upon a hinge, and has various lines constructed upon it of various uses. The lines of chords may be easily found upon it.

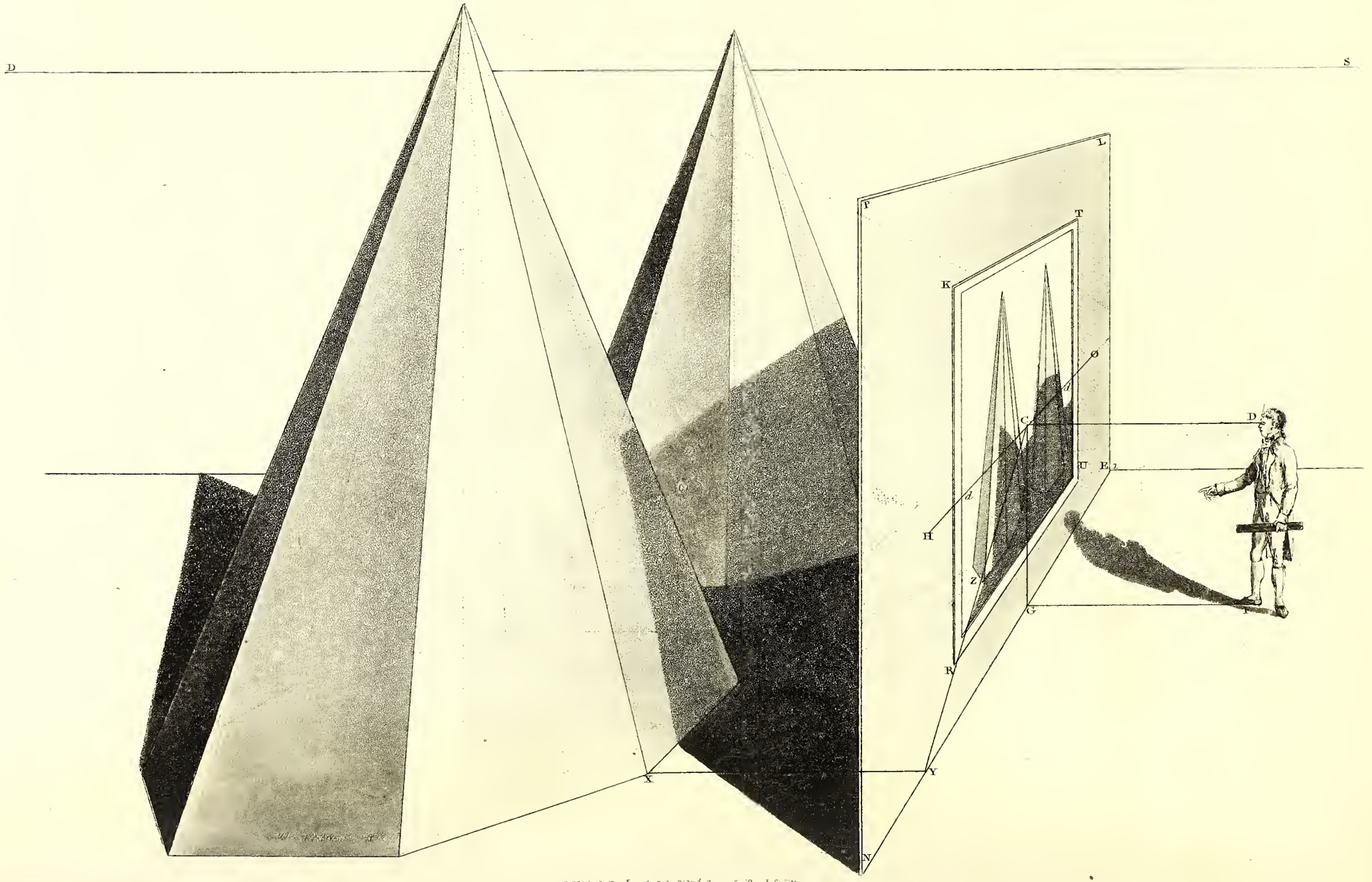
† An Arc of a circle is always the measure of an angle. Every circle is supposed to be divided into 360 parts called degrees, marked thus°. A right angle contains 90°.

IX. *To divide a Line into two Parts proportional to two other given Lines.*

(Fig. 9.) A B and C D are the two given lines. A D is the line to be divided. Draw A B, and at one extremity of it draw A D in any oblique direction. At D, place C D parallel to A B, and draw the line C B, joining the other extremities of the given lines, and cutting A D in the point E. Then, as A B is to C D, so is A E to E D.

Practical

1ST. EXPLANATORY PLATE



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Practical Perspective.

(Explanatory Plate.)

Sect. 1st. I. PERSPECTIVE is the art of delineating objects on a single plane (as paper, canvas, &c.), in such a manner as that they may appear to retain their original distances beyond that plane and beyond each other, and their original inclination towards that plane and towards each other.

Thus: K T U R is the perspective representation of the original pyramids on the plane PLNE, as they appear to the figure who is looking at them.

II. In drawing the perspective representation K T U R, the figure who is supposed to have drawn it must have used these following lines and points.

1st. The line H O, called the *horizontal* line, because parallel to the ground and horizon.

2nd. The line C D, which is the *distance of the eye* from the plane of the picture.

3d. *The point of sight*, or *perspective center* C, which is a point in which a line, drawn from the eye of the spectator perpendicular to the horizontal line, would cut the plane of the picture. This point will always be on the horizontal line, and should be near the middle of the drawing or painting.

OBSERVATIONS.

Sec. 2. I. It is apparent to every one that distance lessens the appearance of every object, and that every object is lost in the boundary of our sight, which is the horizon, and is here represented by the *horizontal line.*

II. As we can only direct our sight to one point at a time, so there can be only one *point of sight* in a picture.

III. All walls, sides of buildings, roads, &c. and, in short, all lines, that are directed *straight forward* from the spectator, must tend to the point of sight.

IV. All walls, sides of buildings, roads, &c. that are *oblique* to the spectator, that is, are not directly straight forwards, tend to some point in the horizontal line, but not to the point of sight.

V. All *sloping* walls, roofs of houses, hills, &c. must tend to some point either above or below the horizontal line.

VI. In explaining the following plates, these points will be called *vanishing points.*

VII. By looking at the *first explanatory plate*, the meaning of a cone or body of rays, cut by the plane of the picture (a thing particularly dwelt upon by all writers on perspective) will be easily conceived.

The eye of the spectator is the point or apex of the cone, and the rays (represented on the plate by fine dotted lines) proceed to every point of the original objects.

VIII. These rays may be supposed to pierce through the plane of the picture, or to be cut by it: each ray must necessarily, in either case, touch the surface of the picture in a point. These points together make up the perspective representation of the objects; and it is the business of perspective to find the positions of these points on the plane of the picture.

IX. The point X of the nearest original pyramid has the ray X Z D, proceeding from it to the eye of the spectator, and it touches the plane or surface of the picture in the point Z.

Let X Y be a line perpendicular to the plane of the picture: it will then be the *distance of the point* X from the plane of the picture: it will also be parallel to C D, which represents the *distance of the spectator* from the plane of the picture. Its perspective representation will (by obser III. of this section) tend to the point of sight C: therefore, suppose the line Y C to be drawn on the plane of the picture: then you may observe that the ray X D performs on the line Y C the operation taught by the IXth Problem of the preceding Geometry; it divides the line Y C into two parts, proportional to the two lines X Y and D C: thus the *distance of the point* X (that is X Y) is to Y Z, as the *distance of the eye* at D (that is D C) is to C Z, the remainder of the line Y C.

Y Z is therefore the perspective representation of the line X Y, which is the distance of the point X, and Z is the perspective point for the original point X: Z is also the point which the ray X Z D (see obser. VIII.) must necessarily make upon the surface of the picture.

The learner is desired to pay particular attention to this last observation, as it contains all the demonstration necessary to enable him to understand the following plates, and will therefore be frequently referred to, that he may not be fatigued by useless repetition.

SECOND EXPLANATORY PLATE.

(Part the first.)

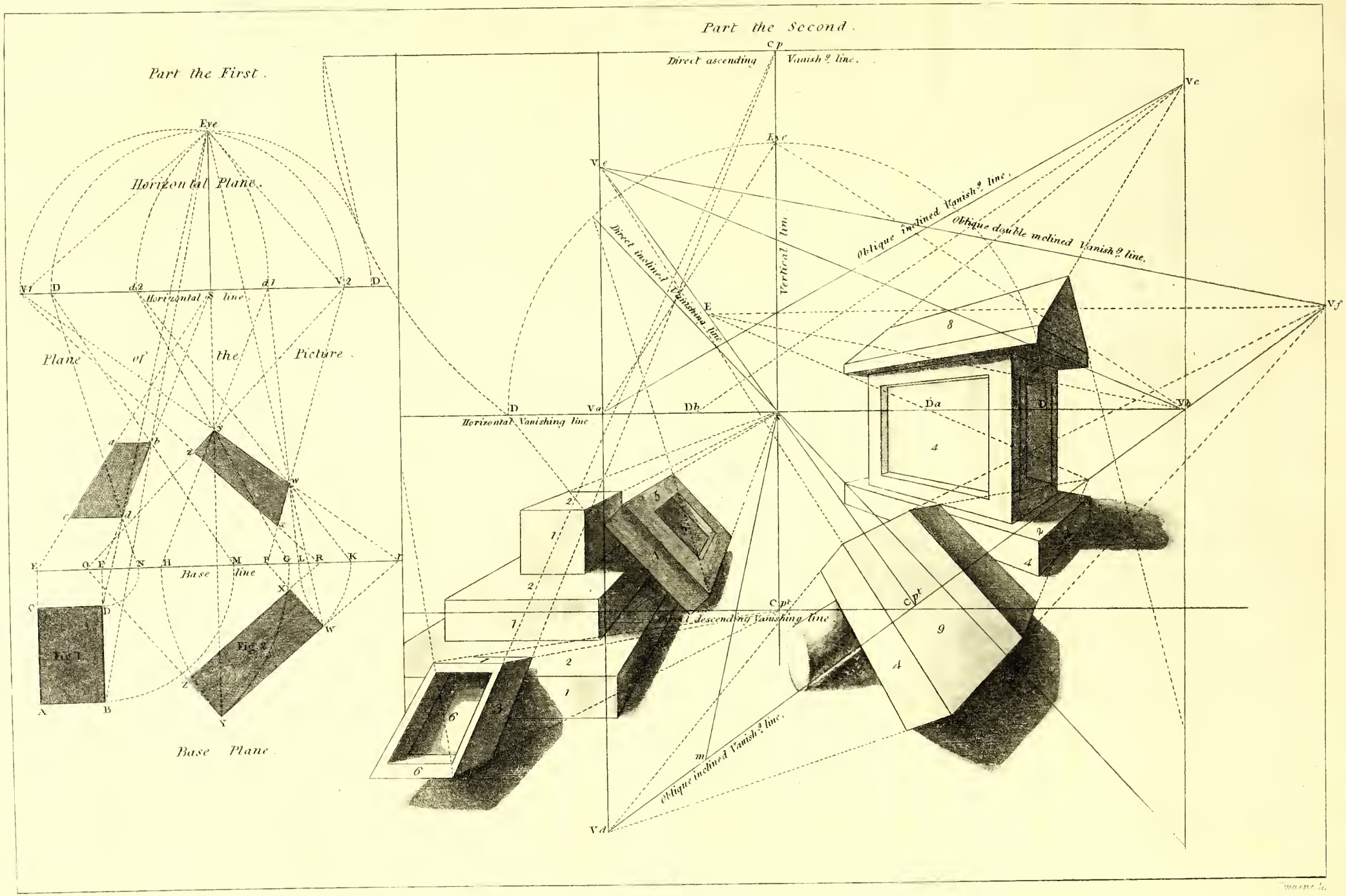
Sect. 3. In the ninth observation of the preceeding section it has been shewn, that the principal object in the operations of perspective, is to divide a right line, drawn on the plane of the picture, in such a manner, that one part of it may be to the *distance of the eye*, as the other is to the *distance of the object*. This would be difficult, and indeed almost impossible, to perform, unless we suppose the three planes reduced into one plane: that is, the *horizontal plane*, in which the eye is placed, and the *base plane*, in which the *point of the original object* lies, must be conceived to be made straight, so as to coincide or form a part of the plane of the picture.

I. The first part of the present plate exhibits these three planes in the form of one plane: the upper part is the *horizontal plane*; and the lower part is the *base plane;* both projected on the *plane of the picture:* their intersections with the plane of the picture being preserved and represented by the *horizontal line* and the *base line.*

II. The ground plan of a cottage or other building to be drawn in perspective is represented by the figures A B C D, which hath two of its sides directed *straight forwards* from the spectator: those two sides, being produced, will cut the base line (as in E & F) and will be parallel to that right line drawn from the *eye* to the *horizontal line*, which by Obser. 3. II. § 1. determines the *perspective center* or *point of sight.*

III. The representations of these sides must therefore (by § 2. III.) tend to the point of sight. Let E S and F S be drawn: and the representations of the points A & B C & D will be in E S and in F S.

IV. Draw lines from the original points A B C D, to the *eye*, and those lines will intersect E S and F S in the points *a, b, c, d;* which will be the perspective representations of A, B, C, D, by observ. IX. § 2.


Part the First.
Horizontal Plane.
Eye
Vl
D
d2
d1
V2
D
Horizontal S line.
Plane of the Picture.
a
b
c
d
y
z
w
x
E
O
F
N
H
M
E
G
L
R
K
I
Base line
C
D
Fig 1
Fig 2
A
B
Z
Y
Base Plane.
Part the Second.
Cp
Direct ascending Vanish.g line.
Ve
Eye
Vc
Oblique inclined Vanish.g line.
Oblique double inclined Vanish.g line.
Direct inclined Vanishing line.
Vertical line.
E
Vf
8
Da
D
Vb
4
D
Va
Db
Horizontal Vanishing line
5
2
1
2
1
Cpc
Direct descending Vanishing line
Cpl
9
4
4
7
2
1
6
3
6
m
Oblique inclined Vanish.g line.
Vd

V. Again let Z Y X W be a ground plan of a cottage or other object; the sides of which are oblique to the plane of the picture. At the *eye* draw lines parallel to Z X & X W intersecting the *horizontal line* in V 1 and V 2: which will be the vanishing points for lines parallel to Z X and X W. (see observ: IV sect. 2.)

VI. Continue Z X and Y W to the *base line* in R and T; and W X, Y Z to the *base line* in P and O; then with the representations of the two former lines tend to V 1, and of the two latter to V 2.

VII. From the *eye* draw lines to each point in the original ground plan Z Y X W: then (by observ. IX sect. 2) the lines tending to V 1 and V 2 will be divided proportionally to the distances of V 1 and V 2 from the *eye*, and to the distances of the original points from the base line in the direction of lines parallel to the lines drawn from the *eye* to the vanishing points.

VIII. The same sort of operation is more generally performed in the following manner. Let the *distance of the eye* from the *point of sight* (S) be laid on the *horizontal line* from S to D and D. Let also the distances of the points in the original ground plans be laid on the base line; as in *Fig.* 1. F D is laid from F to N and F B from F to M. Draw lines from N and M to that distance point (D) which lays on the opposite side of the receding line F S. Those lines will pass through the points *d* and *b;* for F S will be divided in the same proportions as before, since S D (equal to the distance of the eye) is parallel to F N and F M (equal to the distances of the points D and B).

IX. In like manner (see *Fig.* 2) the distances of the eye from V 1 and V 2, are to be laid to *d* 1 and *d* 2 on the *horizontal line;* and the distances of the original points W and Y may be laid on the *base line* either from T to L and H, or from O and P to G and K. In the first case lines drawn from L and H to *d* 1 will pass through *w* and *y* on the receding line T V 1; and in the second case lines draw from G and K to *d* 2 will pass through the same points *y* and *w* at their intersections on the receding lines O V 2, P V 2. In either case the ninth problem of the introductory Geometry is performed according to observ. IX. sect. 2.

SECOND EXPLANATORY PLATE.

(Part Second.)

Sect. 4 I. Hitherto the only vanishing line which has been mentioned is the *horizontal line;* which is the intersection of the *plane of the horizon* with the *plane of the picture.* It is also apparent that the *plane of the horizon* passes through *the eye,* extending to the boundary of our sight called the *horizon;* and that it is parallel to all *level surfaces.*

II. Any other plane parallel to any other *plane surfaces* may also pass through the eye, and intersect the *plane of the picture:* (except a plane parallel to the picture) and any such intersection will also be a *vanishing line,* on which vanishing points may be found, and on which the distances of the eye from such vanishing points may be laid, in the manner taught in the last section with respect to the *horizontal line.*

III. The *first distance* of any *vanishing line* is the length of a right line drawn from the *eye* upon the vanishing plane, perpendicular to that *vanishing line.*

IV. The *central point* of a *vanishing line* is that point on which the perpendicular from the *eye* cuts the vanishing line.

VANISHING LINES.

Sect. 5. Nothing facilitates the knowledge of a science so much as short general views of its fundamental principles: when all its diversities can be classed by some leading characteristic or agreement, common to them all, the mind of the student acquires at once an extensive and systematic idea of the whole, which suggests of itself more real instruction than could have been imparted in the most laboured and diffuse detail. Convinced of this truth I have in the second part of the second Explanatory plate, exhibited at one view

examples of almost every possible sort of plane surfaces and their VANISHING LINES. This comprehends the foundation of the doctrine of Perspective as it was simplified by Dr. Brook Taylor, and renders the easy operation, exhibited in Section 3, applicable, by the exertion of a little common sense, to every variety in which an object consisting of plane surfaces can be placed.

I. The plane surfaces marked 1 are *parallel* to the *plane of the picture*, and therefore a plane parallel to them passing through the *eye* can never intersect the plane of the picture. They have therefore no vanishing line, and are drawn in their natural forms, subject to no other alteration but the diminution of distance (sect. 2. I).

II. The plane surfaces marked 2, are *level*, and therefore the *plane of the horizon* is parallel to them; and their *vanishing line* is the *horizontal line;* the *central point* of which is the *point of sight*. All lines or objects on such *level surfaces* are drawn by means of the *vanishing points* and *distance points* on the horizontal line as in sect. 3.

III. The plane surfaces marked 3 are *upright* with a direction *straight forwards* or perpendicular to the *plane of the picture;* they are therefore parallel to a plane passing through the *eye* perpendicular to the picture and intersecting it in the *point of sight* by a line perpendicular to the *horizontal line*. This line is called the *vertical line*, and will be their *vanishing line:* and its *central point* will be the *point of sight*. Its *first distance* will also be equal to the first distance of the *horizontal line;* and lines or objects may be drawn on those *upright direct* surfaces by means of vanishing and distance points taken on that vertical vanishing line as in the examples for the horizontal line in sect. 3.

IV. The plane surfaces marked 4 are *upright* but have an *oblique* direction to the *plane of the picture*. Planes parallel to them and passing through the *eye* will therefore intersect the *plane of the picture* on either side of the *vertical line*, in lines perpendicular to the *horizontal line:* those lines will be the *vanishing lines* of such *oblique upright planes*. Their *central points* will be their intersections with the *horizontal line*, and their *first distance* will be the length of a right line drawn from the *eye* to each intersection.

V. The plane surfaces marked 5 are not *upright*, but are perpendicular to the *plane of the picture*. A plane parallel to them passing through the *eye* will therefore intersect

the *plane of the picture* at the *point of sight*, and will make an angle with the *horizontal line* equal to the slope of such inclined planes. The *central point* of their *vanishing line* will be the *point of sight*, and their *first distance* will be the same as the *first distance* of the *horizontal line*.

VI. The plane surfaces marked 6 ascend, and that marked 7 descends in a *straight forwards* direction. Planes passing through the *eye* parallel to such *direct ascending* or *direct descending* planes will intersect the *plane of the picture* in lines parallel to the *horizontal line*. The *central point* of such vanishing lines will be their *intersection* with the *vertical line*; and are thus determined: let the first distance of the *vertical line* be laid from the point of sight on the *horizontal line* as at D; and at the point D let an angle be made with the *horizontal line* equal to the *ascent* or *descent* of such planes. The intersection of the elevated or depressed line of such angle with the vertical line will be the *central point*, through which the *vanishing line* may be drawn; and the *first distance* of those *vanishing lines* will be equal to the distance of the *central point* from the point D.

VII. The plane surfaces marked 8 and 9 *ascend* or *descend* in an *oblique direction*. Planes passing through the eye parallel to such *oblique ascending or descending planes* will pass through the vanishing point of right lines drawn on such planes in the direction of their obliquity to the *horizontal line*, and through the vanishing points of right lines drawn in the direction of the obliquity of such planes to the *vertical line*. The nature of such planes will admit of much diversity in their *vanishing lines*, and practice will render their delineation familiar. The *central points* of any *oblique inclined vanishing line* is found by drawing a perpendicular from the *point of sight* to such *vanishing line*: and the *first distance* thereof will be found by laying the *first distance* of the *horizontal line* from the *central point* of the *oblique vanishing line* and drawing thereto a line from the *point of sight*, which line will be the first distance sought. Thus if V d V f be an *oblique inclined vanishing line*; draw from S (the point of sight) a perpendicular intersecting V d V f in C pt; then C pt will be the *central point* of V d V f; and laying the *first distance* of the *horizontal line* (that is the distance from S to *eye*) from C pt to *m*, join S and *m*, and the line S *m* will be the first distance of that *oblique inclined vanishing line*.

These oblique lines will be seldom necessary to be actually determined by the landscape painter, but their general direction should be carefully considered for the sake of those vanishing points which, rising or descending in oblique directions will be found in them. All lines that are parallel to each other in real objects, will, if they are not also parallel to the

picture, tend to the same vanishing point. It is therefore the business of the landscape painter to determine that common vanishing point as accurately as possible, even when taking a view in the open fields without ruler or compasses; and this he cannot do without a clear idea of the contents of this section. It is this clear idea, which, with the practice contained in the following examples, will enable him to reap the knowledge of the genuine principles of his art; and to lay aside the tedious and intricate operations of perspective delineation, with a certainty that his judgment hath imbibed from them such criterions as cannot err.

PLATE I.

Sect. 6. It has been said in sect. 2, observ. III, that all walls, sides of buildings, &c. that are directed *straight forward* from the spectator, must tend to the point of sight. Of such a nature are the walls, &c. in this plate, that are not opposite or facing to the spectator: except the sloping sides of the pyramid.

I. All walls, sides of buildings, &c. which are exactly opposite or facing to the spectator, are drawn in their natural forms, the dimensions only decreasing (sect. 2, observ. 1.) according to the distance.

The fountain side of the pedestal of the pyramid is opposite to the spectator; also two sides of the building.

II. In this plate the *height of the eye* is supposed to be the natural height of a human figure. This need not always be the case, but it is preferable in general, and particularly in views where the ground is nearly level.

III. Having determined the height of the eye of the spectator, the *horizontal line* H O, must be drawn that height above the lower line of the drawing (sometimes called *the ground line*), and parallel to that lower line.

IV. The *center*, C, is then determined, or as it is generally called the *point of sight*, at pleasure on the horizontal line.

V. Observ. IX. of the second section, has shewn the use of the distance of the spectator in finding any point in the picture. Let the supposed distance be laid from the point of sight C on each side to D and D.

VI. Remember that the *horizontal line*, the *point of sight*, and the *distance*, are absolutely necessary to be determined before any drawing is begun, or some errors will unavoidably happen. In taking views they will be found useful directors of the artist, and even in copying prints they will be advantageously attended to.

PLANES PARALLEL & PERPENDICULAR TO THE PICTURE.

PLATE I.

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VII. By observ. III. sect. 2. the tendency of the receding lines in this plate is known. A thin ruler laid on the point of sight, C, and along any oblique line, will fully explain any thing that may be required in that respect.

VIII. The proportions of the receding parts of the buildings remain to be explained: for this let the reader call to mind the IXth observ. of sect. 2.

The line A B G H drawn from one corner of the building intended to be proportioned, is parallel to the horizontal line. The part A B, represents the width of the first wing, if it were opposite to the spectator; the part B G represents the distance between the wings; and the part G M is equal to A B, and is the width of the farther wing. A ruler laid from the distance (D) near H, to B, to G, and to M, will give the perspective proportions on the line drawn from A to the point of sight. (See observ. VII. this sect.)

IX. The pedestal of the pyramid is square; P R is therefore in the original object equal to P W. The line P Q is therefore drawn parallel to the horizontal line, and equal to P W. A ruler laid from Q, to the distance (D) near O, will give the point R on a line drawn from P to the point of sight, (See the IXth observ. sect. 2).

X. If at R a line be drawn parallel to P W, and at W a line be drawn tending to the point of sight, the figure P R T W will represent the square base of the pedestal. The lines P T, W R, will cross each other at X, which will be the center of the square foundation of the obelisk. Let X Z be drawn from X perpendicular to the horizontal line (Geom. Pr. II.), and the inclined sides of the obelisk will meet in a point on that perpendicular line, as they do in the point Z.

XI. For the rest of the drawing, the eye and judgment may be trusted, the accuracy of which powers it is the business of perspective to increase.

XII. It must be carefully observed that figures supposed to be about the same height, and upon the same level ground, in a drawing in which the horizontal line is placed, as in this plate, about the natural height of the eye, should have their heads touching the horizontal line in whatever part of the drawing they may be. The neglect of this rule produces great absurdities in many views, &c. which are otherwise beautiful.

PLATE II.

Sect. 7. AS the example of the last section was constructed upon the IIIrd. observ. of sect. 2, so is this upon the fourth observation of the same section. The walls, sides of buildings, &c. of this example are all oblique to the eye, therefore do not tend to the point of sight.

I. The horizontal line and the point of sight must be determined in the same manner as in the last example. (See observ. II. III. and IV. § 6.).

II. Since the sides of the buildings are not directed straight forward, the angles they make with the plane of the picture must be determined. In this example, the front of the abbey makes an angle of 48° with the plane of the picture, and as its walls are square with each other, the other side must make an angle of 42°, which is the number of degrees wanting to complete a right angle, (called the complement to the former angle).

III. At the point of sight, let C E be perpendicular to the horizontal line, and also let C E be equal to the distance of the eye of the spectator. Let the line P P be drawn through E, parallel to the horizontal line. At E, let an angle be made of 48° with the line P P, on that side of the picture to which the front of the abbey is directed, and let the side E Va, of the angle be continued till it touches the horizontal line in Va. The point Va will be the vanishing point (IV. and VI. of § 2.) of all the lines that recede from the eye of the spectator, in the same direction as the front of the abbey. All which lines will be easily discovered by laying a ruler on Va, and on any line of that tendency. The point Vb is found by making an angle of 42° in the same manner as at E, and is the vanishing point for the other side of the abbey, &c. as may be known by the application of a ruler.

IV. The distance of the eye of the spectator from that point of the plane of the picture in which the front of the abbey, &c. vanish, is the line Va E; the truth of which may be easily apprehended. That distance being laid from Va to Da on the horizontal line, the proportions of the towers and porch in the front of the abbey may be determined in the same manner as the proportions of the wings of the building were in the last example.

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In the same manner E Vb is laid on the horizontal line, and determines the point Db, by which any lines that tend to Vb may be proportioned

V. The cross is exactly opposite and parallel to the front of the abbey, and therefore tends to the same vanishing points. The rest of the drawing may be completed by the observation of the pupil, attention being paid to what was before noticed concerning the figures in the last example.

Sect. 8. As the upright stone on which the title is written in the title plate may also illustrate the principles of this example, I shall here mention that it is drawn upon the same oblique construction. The vanishing point of its front is out of the limits of the paper, but the distance or proportion point of that vanishing point is marked Db. Va is the vanishing point of the side of the stone, and Da is its distance or proportion point. By help of these distances the length and thickness of the stone are determined. The line N A M is drawn parallel to the horizontal line at the corner point A, taken at pleasure, and because the stone is supposed to be three times as long as it is thick, three divisions are laid from A to M, each division being $\frac{1}{3}$ of what its length would be were it opposite or parallel to the spectator. Then, because the bottom of the front tends to the vanishing point Vb (which is out of the limits of the plate), a line drawn from Db to M will determine the point L. For the thickness, one division is laid from A to N, and because the bottom of the side tends to the vanishing point Va, a line drawn from Da to N will determine the point B. Then A L is the perspective length, and A B the perspective thickness of the stone, in proportion to the distance of the eye of the spectator from those points in the plane of the picture, which denote thse points in the actual horizon, to which the sides of the stone are directed; and in proportion to the distances of the points A, L and B in the real object, from the plane of the picture in the directions of the sides of the object. See observ. IX. § 2. also Prob. IX. of Geom.

PLATE III.

Sect. 9. AS in the two foregoing plates the IIIrd and IVth observ. of sect. 2, were exemplified, so in this will be found examples of the Vth, in which it is said that all sloping walls, roofs of houses, hills, &c. must tend to some point either above or below the horizontal line.

I. Having determined the horizontal line, the point of sight, and the distance, consider what angles any leading object makes with the Picture; as, for instance, the pedestal in front, parallel to the left side of which rises the first flight of steps.

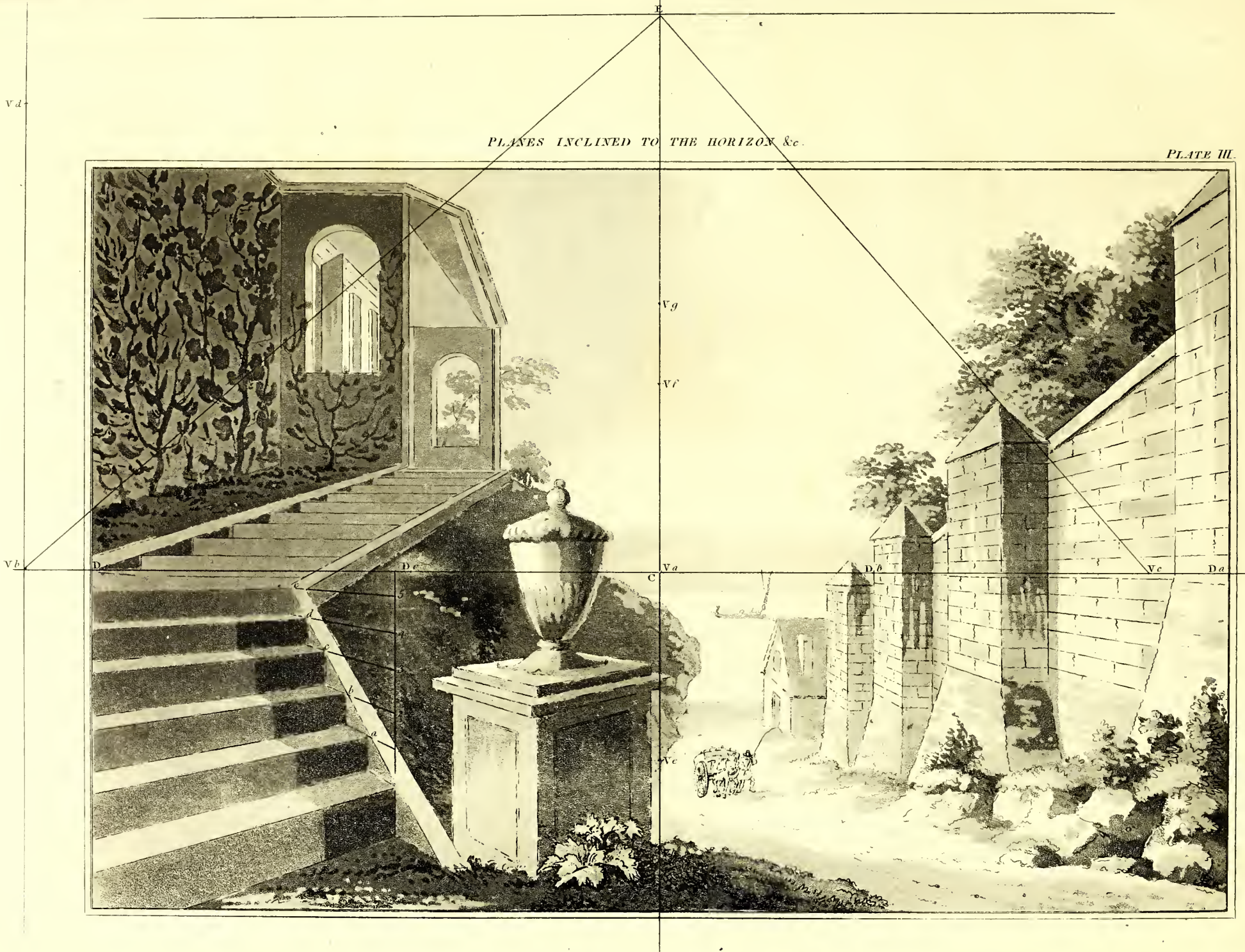
II. At the point E, construct those angles* (as directed by observ. III. § 7.) and observe where their sides, cut the horizontal line as in Vb and Vc, and lay the distances of the vanishing points so found from Vc to Dc, and from Vb to Db, and construct the pedestal as in the example given in the last section.

III. At Vb, which is the vanishing point for all lines parallel to the left side of the pedestal, draw a line perpendicular to the horizontal line.

IV. If the angle which the first rise of the steps makes with level ground be known, make at Db (which is the distance of Vb), that angle with the horizontal line, and mark where its side rising cuts the perpendicular raised at the vanishing point, as in Vd.

V. When the slope rises from the spectator, the angle is constructed above the horizontal line: when the slope descends from the spectator, the angle must be beneath the horizontal line.

* Those angles are not given here, and in taking views they cannot be supposed to be as accurately determined as when a piece of architecture is the subject to be drawn: but it must be remembered, that whatever angle is assumed as the apparent angle, which the side of a building, &c. is supposed to make with the plane of the picture, the other angles of the building must be made to conform therewith: as if, for instance, the sides are at right angles to each other, the correspondent angle at E must be the complement of the assumed angle.



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VI. As it will often happen that the angle of the slope cannot be exactly known, it will be sufficient for the accuracy of Landscapes to take a point in the perpendicular drawn as directed in observ. III, according to the *apparent* slope of the hill or building.

VII. The perpendicular in which the point is either so taken, or found by the construction of a known angle, must always be erected at the vanishing point of such level lines, as might be supposed to pierce the hill or building directly from the rise or fall of the slope, as the side lines of the tread of the steps, which are level, and tend directly from the rise of the slope, and have their vanishing point in Vb.

VIII. The supporting wall of the first steps is drawn by making the top tend to its vanishing point Vd.

IX. As any level line direct from the front of the rise of the second flight of steps would tend to the point of sight, the vanishing point of the supporting walls will be in the perpendicular to the horizontal line at the point of sight, that is the perpendicular C E.

X. If the angle were known, it might therefore be made at Da, or Da, which are both equal to C E, and its rising side would cut the perpendicular in Vf; but if it be not known, the point Vf in C E may be assumed according to the supposed slope. Then Vf is the vanishing point of the rise of the upper flight of steps.

XI. To proportion the heights of the steps, let a perpendicular line be drawn, as A B, touching the bottom step, and set upon it the height of each step, proportionate to the distance of the first step. From each point in the line A B, draw lines to the vanishing point Vb, and observe where those lines cut the top of the wall in a, b, c, d, e; at the points a, b, c, &c. draw lines parallel to A B, and you will have the heights and treads of the steps as in the example. Note, the bottom step in this example is much higher than the others. The upper flight of steps may be proportioned in the same manner.

XII. The portico is constructed according to the instructions given to PLATE I, as tends to the center or point of sight; except the top or roof, which is constructed in the following manner.

XIII. The nearest side of the sloping roof rises from the spectator, and since its level lines tend to the point of sight, its vanishing point must be in the line perpendicular to the horizontal line at C. Let it be Vg, found either by knowing the angle and constructing it at Da accordingly, or by assuming it with regard to the apparent slope.

XIV. The further side descends from the spectator, or from the plane of the picture, its vanishing point will therefore be beneath the horizontal line, and because the slopes of each side are alike, it will be the same distance below the level vanishing point as the former vanishing point is above it. Therefore make C Vh equal to C Vg. Then Vh is the vanishing point for all lines descending from the plane of the picture in that direction, so that the lines composing the roof of the portico will tend either to Vg ascending or to Vh descending.

XV. The level lines of the right hand wall tend to the point of sight. The descending slope lines tend to Ve, found as before directed; as do all the lines of the declivity. The house at the bottom of the hill is constructed according to the instructions given in sect. 6, and in the present section.

XVI. The tops of the buttresses of the right hand wall meet in a point, and are constructed according to sect. 6, X, as are also the feet of the buttresses, which if continued would rise to the same point.

XVII. The circular parts of the openings in the portico may be drawn by hand, their perspective construction depends upon the instructions in the next section.

PLATE

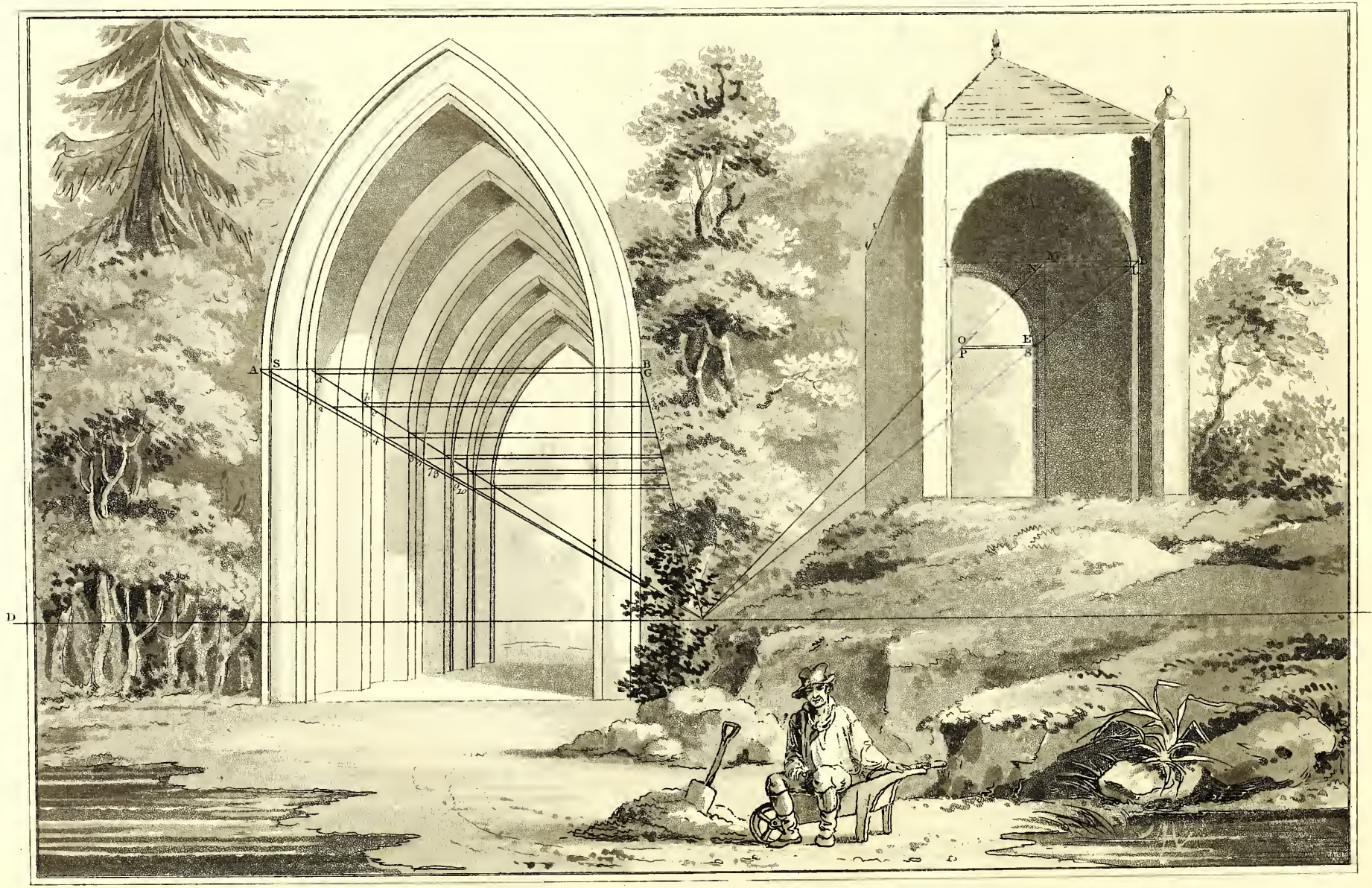

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PLATE IV.

Sect. 10. AS all plane objects, which are directly opposite to the eye or parallel to the plane of the picture, are delineated in their original forms, so all the objects of this plate depend upon the most simple principles of perspective.

The front and sides of the buildings are drawn by the instructions for the first Plate, and the circular parts are opposite to the spectator, and therefore remain exactly circular.

I. The small square garden box, with circular apertures, on the mound on the right, is thus constructed:

The sides, roof, and the square front posts, depend entirely upon the instructions given for Plate the first.

II. Let the height of the upright part of the door-way be determined by the straight line A B. Bisect A B in M, and at M, as a center, construct the outer circle.

III. To find the center for the first inner circle: draw the lines B C and M C to the point of sight, and at L draw L N parallel to A B. Then N will be the center of that inner circle, and N L the radius.

IV. The other aperture being determined by the process taught in sect. 6, observe where the inner part of the upright part of the door-way cuts the line B C, as it does in the point E. At the point E, draw a line parallel to A B, which will cut M C in O: then O is the center, and O E the radius of the second inner circle. Then observe where the outward part of the upright part of the door-way cuts the line B C as it does in the point S, and draw a line at S parallel to E O or A B, which line will cut M C in P, then is P the center, and P S the radius of the second outward circle.

V. The Gothic arched way is likewise opposite to the spectator. The sides and the upright parts of the inside posts are constructed by the instructions given in sect 6.

VI. The arch is composed of the parts of two circles, the centers of which are the exterior points at the opposite sides. Thus, A is the center of the opposite circular parts on the front post, and B is the center of the opposite circular parts at A.

VII. Let A C be drawn, and also B C. And let A B be divided according to the widths of the posts, by the rule given in sect. 3, as it is in the points 1, 2, 3, 4, &c. and draw lines across parallel to A B, cutting the line B C in G 2^c, 3^c, 4^c, &c. then the points G, 2^c, 3^c, 4^c, &c. will be the centers of the opposite circles, which rise from the line A C, as the points 1, 2, 3, 4, &c. will be centers of the opposite circles which rise from the line B C.

PLATE

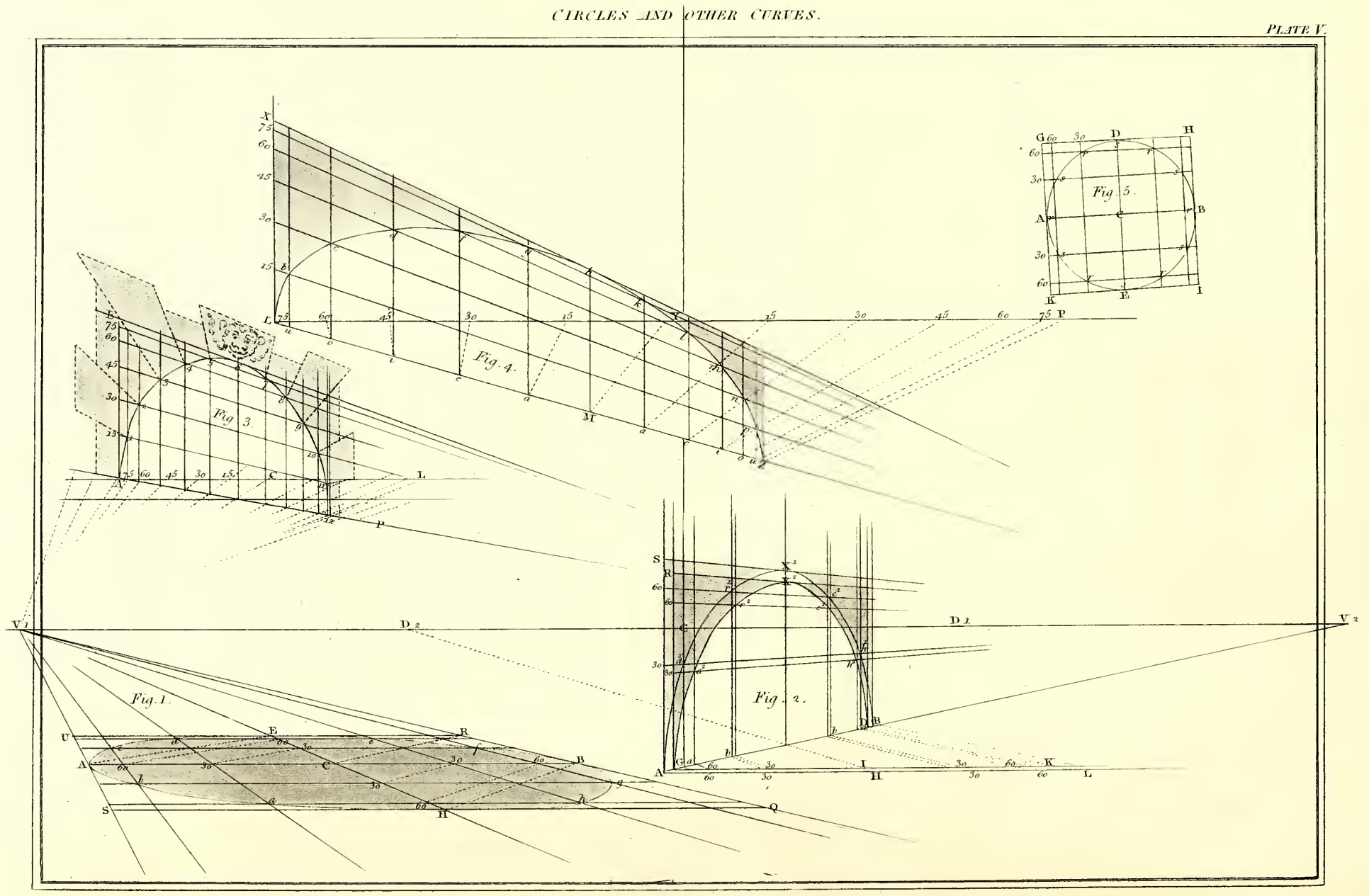

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PLATE V.

Sect. 11. WHEN the plane object is not directly opposite to the spectator, or parallel to the plane of the picture, then, as has been said before, the delineation becomes different from the original form: the circle therefore cannot be described from a center in its representation: it becomes an ellipse or oval, and certain points are to be found in its periphery through which it may be described. Very great exactness is not indeed necessary in landscape drawing, but since arched ways and other curvatures must frequently occur, and in many very beautiful drawings of ignorant artists, these objects, when introduced, raise ridicule and disgust, it will be proper to pay a little attention to their construction, and for that purpose to consider these few diagrams which will be again referred to in the following plates.

I. Fig. 1. is a circle on the ground, or some plane parallel thereto. Every circle may be contained in a square. Let S Q U R be the representation of that square (V1 being supposed to be the point of sight or center of a picture, and D1 the distance), and let A or B be a point perspectively bisecting S U or R Q. Draw A B parallel to S Q, and bisect it in C, and draw C V through C, cutting U R in E, and S Q in H. Open your sector and make C A or C B a transverse distance on the line* of sines between 90° and 90°. Then take the distance between 30° and 30°, and lay it from C to 30 on each side: and lay the distance between 60° and 60° from each side of C to 60 and 60. By laying a thin ruler from the distance D1, transfer the points 30 and 60 each way to the line H E. Through the points in the line A B draw lines to the point of sight. Through the points in the line H E, draw lines parallel to the line A B. Observe the intersections of those lines in a, b, c, d, e, f, g, h, which points, together with the four A, E, B, H, will make twelve in the circumference of the circle through which its representation may be drawn by the hand with ease.

* The line of Sines on the sector is generally on the same side with the double line of tangents marked T, and is itself marked S, It may be distinguished from the line of secants, because the latter line does not rise to so high a number as 90°

II. If the circle to be represented be too small for this operation with the sector, describe a circle with the radius of your circle proportioned to the distance, on any other paper, as figure 5 Set the radius round it, which will measure it exactly six times, as at r, r, r, r, r, r: divide any space, r r, in two at s, and continue that division round the circle. Through any opposite divisions, r, r, or s, s, draw the perpendicular diameters A B and D E; and through the other divisions draw lines parallel to A B and to D E, as in the figure. Then on the lines C A, A G, &c. will be projected the sines of 30° and 60°, which may be then transferred to your figures.

III. Fig. 2. Represents a double arch, or the perspective delineation of two concentric semicircles. The vanishing point of the plane on which the arches are struck is at V2, the point of sight or center is C, the distance D2: A S represents the half-side of a perspective square containing the largest semicircular arch, and is therefore a radius of the semicircle. Draw any line, A L, parallel to the horizontal line. Lay A S on it to H and to L. Make A S a transverse distance between 90° and 90°, and take 30° and 60° as before; lay the 30 and 60 from A towards S, and from H towards A and towards L. From the divisions 30 and 60, on the line A S, draw lines to the vanishing point V2, and by means of the distance, D2, project the divisions of the line A L on the line A B, as at a, b, b, a, and at those points draw lines parallel to A S, and the intersections of those parallels with the other lines drawn to the point V2 from the points of division, will give the points a^1, r^1, c^1, h^1, through which the greater arch may be delineated.

IV. The smaller arch is projected in the same manner. G R is radius, G I, I K, is its diameter on the line parallel to the horizontal line, and a^2, r^2, c^2, h^2, are its four points so found. The point A, X^1, B, are easily conceived to be in the circumference of the outward arch, and the points G, X^2, D, in the inward or smaller arch.

V. Fig. 3. Is an arch constructed in the same manner. D1 is its vanishing point, and V1 is its dividing or distance point. Instead of the sines of 30° and 60°, the sines of 15°, 30°, 45°, 60°, 75°, are taken, by which means its circumference is exactly divided into twelve parts for the sake of drawing the surrounding stone work.

VI. Fig. 4. Is an ellipse projected in perspective (vanishing point V2, distance D 2). L X is its height with respect to distance, &c. L X is therefore made a transverse distance between 90° and 90° on the sector, and the sines 15, 30, &c. are taken and laid on the line L X. L P is its longest diameter, which is bisected in Y. L Y is then made a transverse distance on the sector, and the points 15, 30, &c. taken as before: those points are projected by means of the distance point on the perspective diameter L Z, and the points b, c, d, f, g, &c. are found as similar points were in the last examples.

PLATE VI.

Sect. 12. In this plate, the arch of the bridge is a double semicircle, and is delineated according to *figure* 2, in the last section. It therefore scarcely needs a repetition of instructions.

I. The bridge is oblique to the picture and to the spectator, it therefore belongs to the instructions given in section 7.

II. Its vanishing points are V1 and V2, and its distance points are D1 and D2. The center of the picture is C.

III. The sloping parts of the bridge belong to the instructions given in sections 6 and 4: the vanishing point of the rising part is V3; the vanishing point of the descending part is V4. To these the rising and descending tops of the railing, &c. tend. The level part of the bridge tends to the vanishing point V2.

IV. The width of the bridge being determined, the farther railing may be drawn tending to the same vanishing points.

V. The middle of the level part of the bridge being determined by means of the distance point D2, draw there a line perpendicular to the horizontal line, and let it cut the line A M, V2 in M; on that perpendicular determine the height of the arch as M X^1. At M, draw the line M R parallel to the horizontal line, and set M X^1 to R. And laying a ruler at D^2 and R, mark where it cuts the line A M, as in A. And at A, draw the line A S parallel to M X^1, terminated at the point S by a line drawn through X^1 and the vanishing point V2. Then the arches may be drawn as is shewn in fig. 2. (§ 11, observ. III.) Note, the arch in the diagram of plate V is rather larger than that on the bridge, for the sake of perspicuity.

VI. The horizontal line in this plate is about a foot below the height of a man. This is done because the principal object is of itself low, as well as the surrounding country, but by the lowness of the horizontal line it acquires some elevation, and looks better than it would do were the horizontal line as high as usual.

E

ARCHES &c INCLINED TO THE PICTURE.

PLATE VI

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VII. The figures are all proportioned according to the height of the man who appears to have caught a fish, his height is projected to the bridge, and gives the height of the figures on the bridge. The nearest figure who is fishing, is not so tall as the others.

PLATE

PLATE VII.

Sect. 13. I. THE interior part of an ancient bath is here represented. The horizontal line is about the height of a man. The center of the picture, or point of sight is at C. The sides of the building vanish in V1 and V2, which are the same as the distant points of the center of the picture, and their distance points are D1 and D2. That part of the plate which consists of right lines and their divisions is therefore easily understood, from what has been before observed in sections 3 and 4 particularly.

II. The elliptical or oval arch may also be delineated according to the instructions given in section 8, VI; concerning fig 4. Thus L X in this plate is the same as L X in Plate V, fig 4, and L P here is the same as L P in that example; the construction is therefore exactly the same. So of the higher oval, T S is the height, and T W is the length, and the construction is perfectly similar.

III. The rising sides of the roof are also elliptical. The small part which is seen may be drawn by the hand, without recourse to points; but since exactness in buildings is more requisite than in the general landscape, the manner of obtaining points shall be explained.

IV. At the point where they meet, that is, at M, let a line parallel to the horizontal line be drawn, at that point also let the lines be drawn that form the basis of the elliptical arches of the sides (those lines are marked O and R): On the lines O and R continued, find the middle point of the sides, which may be more easily done, as the building is supposed square, and project those middle points on the line at M, parallel to the horizontal line. At M let a perpendicular be erected (this is supposed to be done on the plate, where most of the lines belonging this operation are omitted, since it will be understood clearly enough without them). On that perpendicular set the height of the ovals with respect to that distance. The height of the ovals on the example is one-fifth of their length. You will then have the height and half the length of each oval, and they may be projected in the same manner as the former examples of elliptical arches.

VARIOUS ARCHES INCLINED TO THE PICTURE.

PLATE VII

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V. The arches in the right hand wall are circular, but being oblique to the eye, are constructed according to the instructions given in section 8, fig. 2 and 3. A H is the height of those arches according to the distance of the line A H from the eye. A Z is the line parallel to the horizontal line on which the distances and widths of the arches are to be set, according to the proportion of A H. Those widths, &c. are to be projected on a line drawn from A, and tending to the vanishing point V1, forming perspectively the basis of the arches. The arches may then be drawn through points found by the sines of the sector as before taught.

VI. The bath is circular; two arches of circles must therefore be described representing the width of the rim of the bath.

VII. It was said before, that the building was exactly square, and that its sides tended to points equally distant from the point of sight, and therefore to its points of distance. The reason of the following operation will be manifest on a little reflection. Having determined the point I, a point in the circumference of the outward circle exactly opposite the middle of the great elliptical arch, let a line* be drawn from that point I to the vanishing point V2. Then lay a ruler from the point of sight C to the corner point F; observe where it cuts the last drawn line, as in the point N, and through the point N draw a line from the vanishing point V1. Then will those two lines be the two sides of a square containing the proposed circle, of which I is a point in the circumference. Draw I K parallel to the horizontal line, and on the side of the square tending to V1 you will have the point K, another point in the circumference of the circle. Then if the edge of a ruler be laid on the point N, and the distance point D2, it will give the point Q on the line parallel to the horizontal line, then I Q will be the radius of the circle with respect to that distance. Let it be made a transverse distance on the sector, take the divisions of the sines as before taught, and lay them both from I and from K. Let those from K be projected on the side N K of the circumscribing square, and those from I on the side I N. Then lines drawn to each point will give the points in the circumference of the circle required. The inner circle may be drawn in the same manner.

* This line, and many of the others in this plate, are omitted, because they may be easily supposed, and experience shews that it is enough to describe the direction of lines perspicuously in such diagrams as these.

VIII. For the pavement, let the length of a diagonal of one of the squares at the bottom boundary of the picture, as L, be laid along the bottom line, and rule lines to each vanishing point, and you will have the squares of the pavement. But since the bottom boundary will not be sufficiently long to contain enough divisions for all the squares, another line must be drawn where the squares begin to fail, and the diagonals laid upon that in proportion to the distance, and lines again drawn to each vanishing point. Or, let the diagonals proportioned to their distance be at first laid upon the line I O N, continued to the inner line of the front of the bath, and lines ruled to each vanishing point as before; by this method more squares will be obtained at the same time.

PLATE

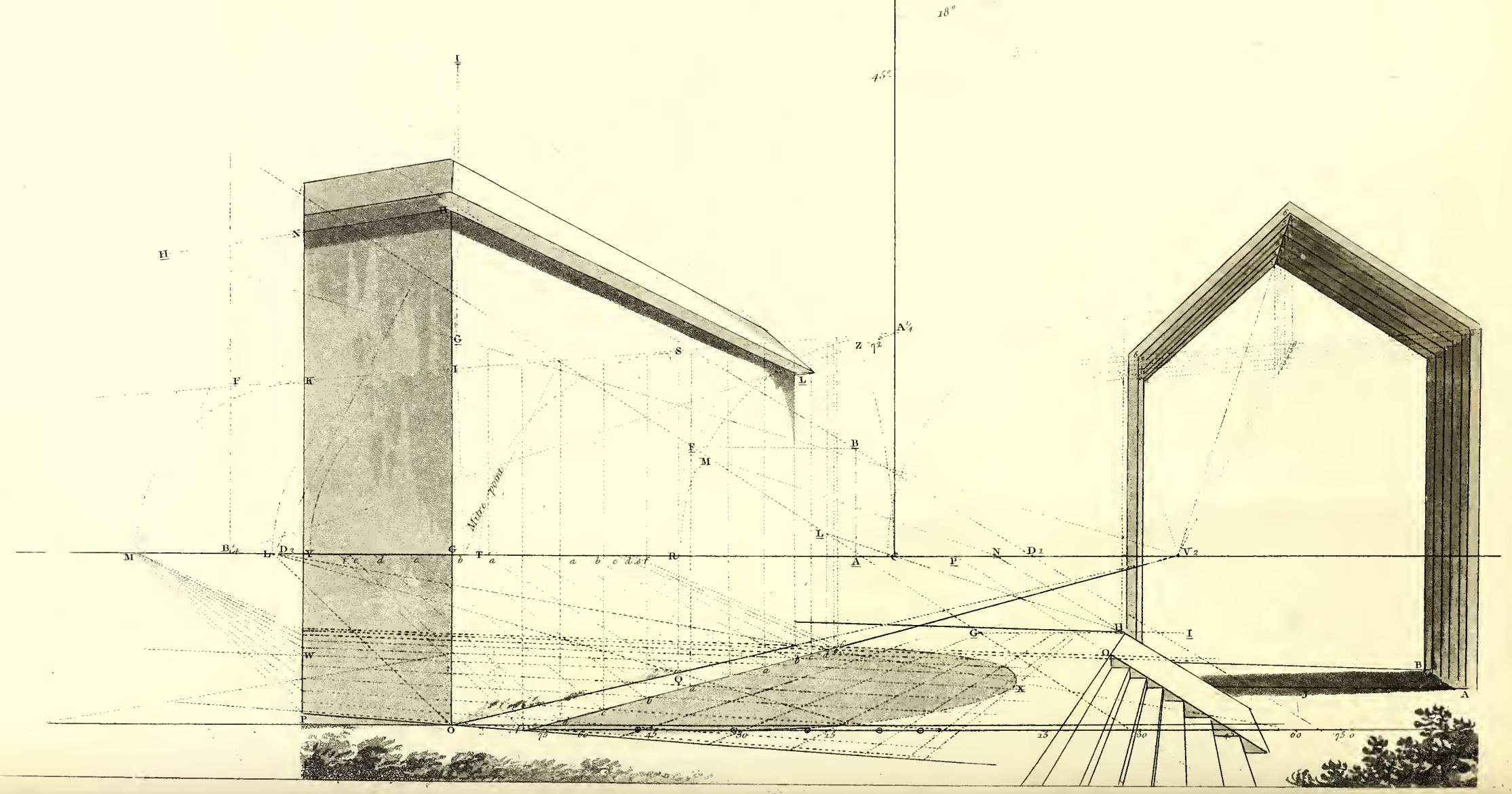
18°
45°
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PLATE VIII.

Of inaccessible vanishing Points, &c.

Sect. 14. IN perspective a great portion of the art depends upon the ingenuity of the artist; the principles are of themselves simple, but the variety of the forms and positions of the objects to be delineated, renders the application of those principles sometimes intricate. The instructor can do more than point out the principles upon which the artist must proceed: That task is already performed in the foregoing observations; the present plate exhibits a few difficulties with the expedients made use of to overcome them, and it is hoped and believed, that with these and the foregoing lessons, the pupil will be fully acquainted with as much of the practice of perspective as may enable him to take a view, or draw a landscape with accuracy.

I. When the vanishing point of level lines receding from the eye is out of the limits of the paper, canvas, &c. a difficulty arises, which must be thus supplied:

Let C be the center of the picture, or point of sight; let E be the eye, then C E is the distance. Let V2 be one vanishing point found in the manner taught in section 7; the complement of its angle is 18°, and its angle 72°. The other vanishing point to which the lines in the left side of the building tend would be very distant, its visual line making an angle with the line C E of 72°: it is therefore inaccessible. Therefore instead of the whole line C E, take any part of it, as C A $\frac{1}{4}$, which is $\frac{1}{4}$ of it, and then make an angle of 72°, by drawing the line A $\frac{1}{4}$ to B$\frac{1}{4}$. At B$\frac{1}{4}$ raise a perpendicular, and take B$\frac{1}{4}$ F upon it, a proportional line to C A$\frac{1}{4}$, in such proportion as 4 is to3*, and draw A$\frac{1}{4}$ F, which will tend to the inaccessible vanishing point, and may be called the *vanishing director*.

* This may be done by dividing C A $\frac{1}{4}$ into four parts, and making B$\frac{1}{4}$ F equal to three of those parts, and if C A is $\frac{1}{4}$, $\frac{1}{5}$, or $\frac{1}{6}$, &c. of the whole height, it should be divided in 4, 5, 6, &c. parts, and B F be made equal to 3, 4, 5, &c. of those parts. Or on the line of lines marked L on the sector, make C A a transverse distance between 4 and 4, 5 and 5, &c. and take B F, the transverse distance, between 3 and 3, 4 and 4, &c.

II. Let O and H be two points in the corner of the building, from which it is required to draw H N and O P, tending to the inaccessible vanishing point. O H, the perpendicular junction of the sides of the building cuts the horizontal line in the point G, and the vanishing director in the point I, and Y K W the boundary of the picture (or any other perpendicular line may be made use of) cuts the horizontal line in Y, and the vanishing director in K. Make G L on the horizontal line equal to G I, and Y M equal to Y K. Join L H, and at M draw M N parallel to L H, cutting the boundary line of the picture in N, draw H N, and it will be the line required tending to the vanishing point. Also join L O and draw M P parallel to L O, cutting the boundary line of the picture in P. Draw O P, and it will be the other line required tending to the vanishing point. In the same manner are drawn the other lines tending to the same vanishing point as the line Q X, and the lines from the diameter of the semicircle.

III. When the vanishing point is inaccessible, the distance point cannot be obtained by the method before taught. But since C A$\frac{1}{4}$ is $\frac{1}{4}$ of the distance of the eye from the point of sight, B $\frac{1}{4}$ A$\frac{1}{4}$ will be $\frac{1}{4}$ of the distance of the inaccessible vanishing point, therefore take Z A$\frac{1}{4}$ which is the excess of B$\frac{1}{4}$ A$\frac{1}{4}$ above B$\frac{1}{4}$ C, and lay it four times from C to D1, then D1 is the distance point sought.

IV. When the vanishing point of lines descending or ascending is inaccessible, the operation is nearly the same.

Let it be required to draw the ascending slope* on which are the steps in front of the building. At the distance point D1, make the known or supposed angle of the ascending slope, which angle will be *B* D1 *A*. Take D *A* equal to $\frac{1}{4}$ (or any other portion) of A$\frac{1}{4}$ B$\frac{1}{4}$, therefore equal to $\frac{1}{16}$ of the whole distance. At *A* erect a perpendicular, and at the point *B* in which it cuts the ascending line D1 *B*, draw the line *B F* parallel to the horizontal line, and make *B F* proportional to *A* D1 as 15 is to 16, and draw a line through the points *A* and *F*, then both the lines D1 *B*, and *A F* are vanishing directors. Now, let it be required to draw the ascending lines of the slope at *H* and *O*, and first at H: draw the line *G H I* through the point *H* parallel to *A* D1, cutting one vanishing director in *G* and the other in *I*. Make *G L* equal to *G I* and *A M* equal to *A* D1. Join *L H* and

* This slope though descending from the ground on which the spectator is supposed to stand, yet ascends from the picture.

and draw *M N* parallel to *L H*, cutting *A D*1 in *N*, then through *N* and *H* draw the slope line required. In the same manner the point *P* is found, by means of which the slope line at *O* is to be drawn.

V. The *mitre point*, or *mitre vanishing point*, is a point in which one of the diagonals of a square would vanish: its use is in projecting the jutting corners of buildings, &c. which are always upon the diagonal of a square. Thus a line drawn through the mitre point and the point H of the building will tend to the jutting corner, which may thereby be easily determined. Also if the building be supposed square, and it be necessary to find the center of it (suppose of the roof): let H *H* be the half of the perspective length of the left side, and draw *H* V2 and H to the mitre point, then their intersection at *G* is the center of the building. If the corners of the roof tend to any point over the center (as is frequently the case), erect at *G* a line perpendicular to the horizontal line, and on it take the point *I* and make the corners of the roof tend to *I* as in the example. The center will also be useful to find the tendency of the diagonal of the further corner *L*, by drawing a line through *G* and *L*.

VI. These modes will appear tedious to the painter of landscapes: use will enable him to shorten them, and the more he becomes acquainted with the science by frequent practice, the more likely will he be to discover simple expedients which may facilitate his operations: but he must indispensibly make himself acquainted with the regular methods first, or he will fall into continual errors. On the right hand side of the print is the representation of a shed, of which the open sides incline to an inaccessible vanishing point in the horizontal line, and of which the sides of the roof incline to inaccessible vanishing points above and below it, yet may be performed by simple expedients.

Let the bottom be drawn, and let the line at A tend to the inaccessible vanishing point as before taught, and let it be perspectively bisected in J, and raising a perpendicular at J, let the upper point 6 be determined, and also the depth of the roof at the lower point 6, The line A B and the top line of that side, also the middle line of the roof, and the line at the lower 6, will all tend to the accessible vanishing point V2; let them be drawn and divided according to their distance point D2, as in the example: then lines drawn from the points 1, 2, 3, 4, 5, 6, will complete the figure.

PLATE IX.

SHADOWS.

THE shadows of delineated objects form a part of perspective particularly necessary to the landscape painter: for however inaccuracies may be covered by the artificial shadows so common in landscape drawing, yet it will be found not only useful, but in the highest degree pleasing, if the true shadows are assigned to their several objects.

The sun must be either in the same plane as the picture, or before the spectator, or behind him: these make three principal distinctions in the shadows of objects.

The sun being supposed at an indefinite distance with respect to the picture, its rays are to be considered as parallel to each other.

When the sun is in the plane of the picture the representations of his rays are always parallel to each other, and to the rising line of the angle of the sun's elevation above the horizon, made upon the horizontal line.

When the sun is not in the plane of the picture, let a line be drawn from the *eye* making the angle of his supposed or known obliquity with the vertical plane, and where such line intersects the *horizontal line* let a perpendicular be drawn each way. Again, let a ray from the sun be supposed to pass through the eye piercing the plane of the picture, as it necessarily must, in that perpendicular: then, the point in which it meets that perpendicular will be the *place of the sun on the picture* and will be the *vanishing point* of all lines that represent the solar rays. To determine this let the distance of the point which denotes the sun's obliquity be laid on the horizontal line; and, at that distance make the angle of the sun's elevation above the horizon. It is manifest that the angle must be made with a rising line, if the sun is before the spectator, and with a descending line if it is behind him; because, the ray passing through the eye will, in the first case, pierce the perspective plane above, the horizontal line, and in the other case, beneath that line.

SHADOWS.

Sun 3.

Diagram 1.

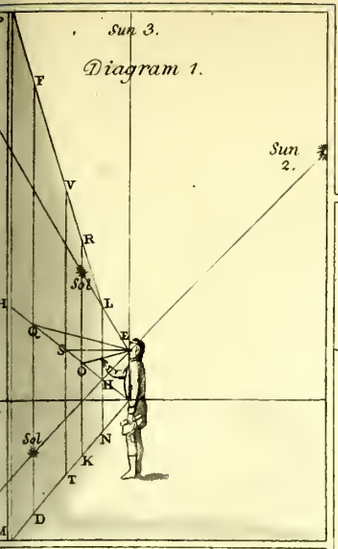
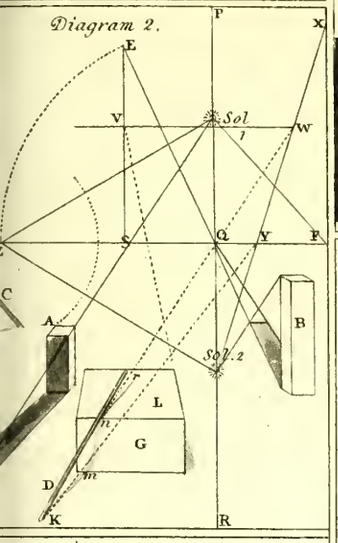
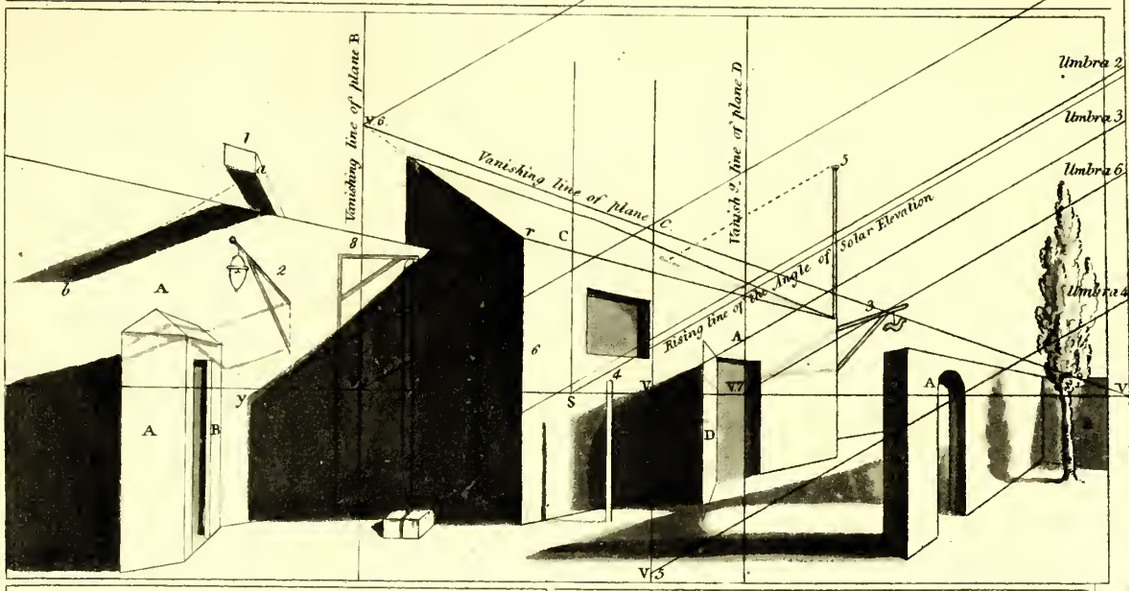
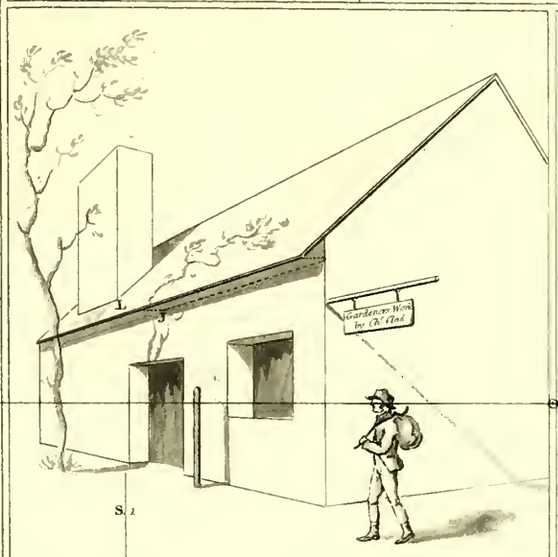


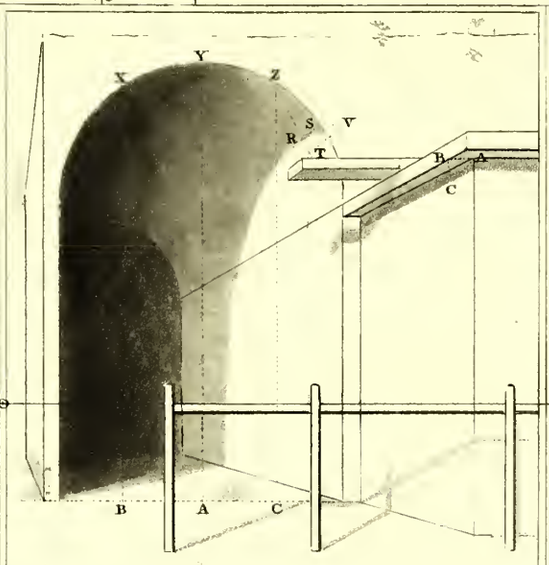
Diagram 2.





Nº 1.





Nº 2.

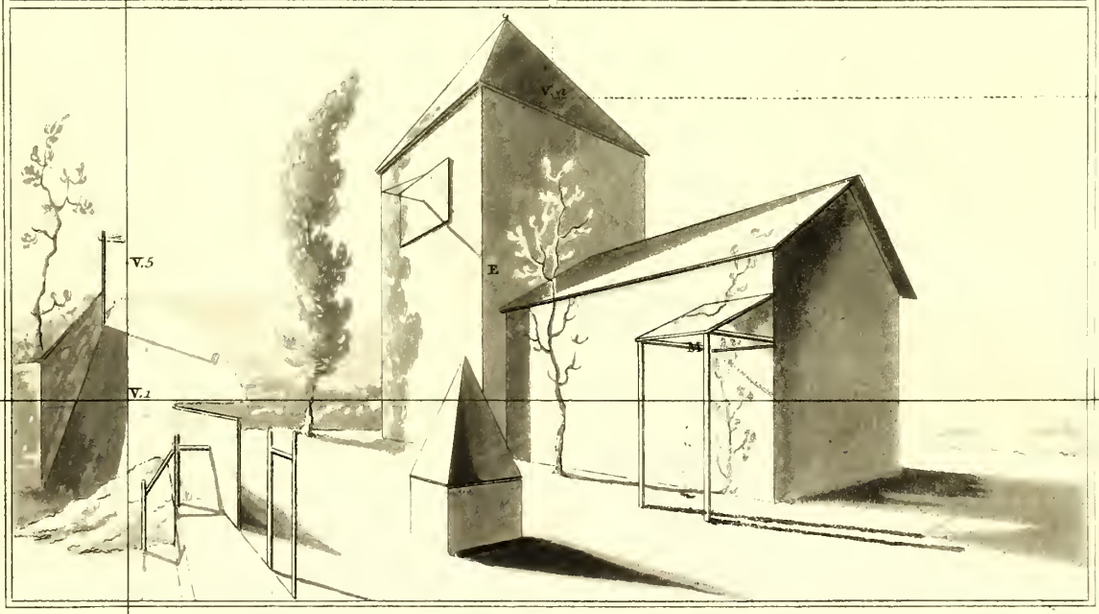
3 Sun

D.1

Solar Point

D.2

V.3



S.h

Nº 3.

S.4

S.3

SV

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N

To comprehend this more clearly let the two small diagrams in this plate be considered. In the first, P L N M is the *plane of the picture:* S is the point of sight thereon with respect to the *eye* at E. H H is the horizontal line, and V T is the *vertical line.* The sun is first supposed to be before the spectator as *Sun* 1. E O is a line making with E S (the *distance line* on the vertical plane) an angle equal to the sun's obliquity. K O R is the solar perpendicular drawn through the point O; this is intersected in the point *Sol* above the horizontal line by a ray drawn from *Sun* 1 to the eye at E. The point *Sol* is the place of the sun on the picture, from which all the representations of the solar rays must be drawn The sun is, secondly, supposed to be behind the spectator, as *Sun* 2. Then (the rest remaining as before) E Q is the line which determines the angle of the sun's obliquity and D Q F is the solar perpendicular which the ray drawn from the sun through the *eye* at E intersects in the point *Sol* below the horizontal line; which is the point from which all the representations of the solar rays must be drawn on the plane of the picture. Thirdly, the sun is in the plane of the picture as *Sun* 3, and its ray, passing through the eye of the spectator cannot intersect the plane of the picture because it is parallel to that plane; the representations of its rays will retain their original parallism, and will make angles with the horizontal line equal to the angle of the sun's elevation.

The second diagram exhibits the practice of the theory which has been explained by the first. E is again the *eye* and S the point of sight. The angle S E Q denotes the sun's obliquity, and P Q R is the solar perpendicular. Q Z is made equal to the distance Q E; and at Z the angle of the sun's elevation is made either with a rising or descending line according to the position of the sun before or behind the spectator; and intersecting the solar perpendicnlar either at *Sol* 1 or at *Sol* 2. The shadow of the object A tends forwards because the sun is supposed to be before the spectator: it tends also from the point Q because, being the shadow of a perpendicular object on a level plane its vanishing point will be the intersection of a perpendicular ray drawn from the sun, at *Sol* 1, with the horizontal line; as will be shewn hereafter. The shadow will be terminated by a ray drawn through the top of the object A from *Sol* 1. For the same reason the point Q is also the vanishing point for the shadow of the object B but as the sun is, in this instance supposed to be behind the spectator, the shadow tends *towards* instead of *from* its vanishing point, and its length is determined by a ray drawn from *Sol* 2 to the top of the object.

MAXIMS

MAXIMS *in the* PERSPECTIVE *of* SHADOWS *produced by the* SUN.

MAXIM 1st. The shadow of any right line on any plane will tend to a point in the vanishing line of such plane: which point will be determined by a ray of the sun drawn from the vanishing point of the right line until it intersects the vanishing line of the plane.

MAXIM 2nd. The shadow of a right line upon a plane to which that right line is parallel will tend to the vanishing point of that right line.

MAXIM 3rd. The shadows of right lines that are in planes parallel to the plane of the picture, and which planes have therefore no vanishing line, may be resolved into two cases: viz,

Case 1. When the sun is in the plane of the picture, the shadow of any such right line will be always parallel to the vanishing line of the plane that receives it.

Case 2. When the sun is not in the plane of the picture a ray of the sun parallel to any such right line will give the vanishing point of its shadow on the vanishing line of the plane that receives it. Thus, the ray drawn from *Sol* 1 (see diagram 2) parallel to the stick C gives the point F in the horizontal line for the vanishing point of its shadow on any level plane

MAXIM 4th. When the plane surface of any object that receives the shadow of a right line is parallel to the plane of the picture (which can only happen when the sun is behind the spectator) the shadow of such right line upon any such plane surface will be parallel to the ray drawn from the vanishing point of the right line to the place of the sun upon the picture.

Example (Diagram 2).

The shadow of the stick D (the right lines of which tend to the vanishing point X) has three divisions. On the ground from *k* to *m* it tends to the point Y in the horizontal

line by *maxim* 1. On the sloping surface L, the vanishing line of which is V W it tends from *n* to *r* to the point W by the same *maxim*. On the parallel plane surface G the part *m n* is by *maxim* 4th parallel to the ray X W Y drawn from *Sol* 2 to the vanishing point X.

APPLICATION of the above MAXIMS.

(SHADOWS No. 1. *The Sun in the plane of the Picture.)*

In this the sun's rays will be parallel to each other and to the rising line of the sun's elevation; which is marked on the plate, as well as the vanishing lines of the different surfaces. The receeding lines of the beam on the wall (marked 1) tend to the vanishing point V2. To find its shadow on the wall draw the ray of the sun from V2 until it intersects the *vanishing line of planes A* in *Umbra* 1, which will be the vanishing point for the outlines of shadow required by *maxim* 1: these are terminated by rays, as *a b* in the example.

The upper bar of the lamp (marked 2) has the same vanishing point, and therefore its shadow on the wall and on the side of the sentry box, tends also from the point *Umbra* 1. The part of the shadow on the roof of the *sentry box* tends to the vanishin point V2 by *maxim* 2. The prop-bar of the lamp tends to V3. Then (by maxim 1) the ray drawn from V3 gives the point *Umbra* 2 on the *vanishing line of planes A* for the directing point of its shadow on the wall and side of the sentry box: its shadow on the front over the door of the box tends to V3 by *maxim* 2.

The upper bar of the sign (marked 3) and its prop-bar have the vanishing line of their plane in the perpendicular at V4; which is the vanishing point of the upper bar as V5 is of the prop. The points for the direction of their shadows on the front of the house are found by maxim 1, at umbra 3 and 4 in the *vanishing line of planes* A, and the shadows are drawn as in the example of the lamp (2).

The post (marked) 4 has its upright lines in planes parallel to the picture and therefore its shadows on the ground will (by *Maxim* 3, *Case* 1.) be parallel to the horizontal line; and that part of its shadow on the front of the house will be parallel to the *vanishing line of planes* A.

The shadow of the bar (marked 5) on the roof of the house will by *Maxim* 3 *Case* 1, be parallel to the vanishing line of planes parallel to the roof.

The corner line of the house (marked 6) is projected in the same manner: and being completed by the ray *r y* the shadow of the rising line of the roof (marked 7) is drawn on the wall with a tendency to *Umbra* 5; a point in the *vanishing line of planes* A determined by the ray drawn from the vanishing point of that rising line according to *maxim* 1.

The crane (marked 8) is parallel to the plane of the picture and therefore the whole of its shadow will be parallel with the *vanishing line of the planes* A since it falls on the wall marked A.

The shadow of the door (D) will be easily understood; the top and bottom of the door have their vanishing point at V7 and therefore by maxim 1st their shadows are directed by *Umbra* 6 *in the vanishing line of planes* A.

The remaining shadows depend so entirely on the preceeding instructions, that they will require no further explanation.

(SHADOWS No. 2. *The Sun behind the Spectator.*)

In these examples the parallel rays of the sun will have a vanishing point; which being found according to the supposed obliquity and elevation of that luminary, as in the explanations of the *diagrams* 1 and 2, let the point of the solar obliquity be in the horizontal line at the point marked *solar point*, and let the *place of the sun* or *vanishing point of his rays* be (first) at $\left\{ \begin{smallmatrix} \text{Sun a} \\ 2 \end{smallmatrix} \right\}$

By Maxim 3 *Case* 2 the shadow of the post (1) will on the ground tend to the solar point, and that part of it against the cottage will be parallel to the object itself since the right lines of the object being perpendicular and parallel to the plane of the picture have no vanishing point.

The direction of the shadow of the pole and board will be determined by maxim 1, by drawing a ray from D1 (the vanishing point of the pole) until it intersect the *vanishing*

line of the plane surface of the side of the cottage that receives the shadow; as it does in S V. S V is therefore the vanishing point for the shadow of the pole and also for the shadows of the top of the window and door as those shadows fall against the sides.

To find the vanishing point of the shadow lines of the chimney on the roof, suppose the vanishing line of the plane of the roof drawn from D1 to V*r;* which let the solar perpendicular (by MAXIM 3, *Case* 2,) intersect in the point Sr, which will be the vanishing point for the shadows of all perpendicular lines on the roof of the cottage. It is, therefore, to Sr that the shadow of the chimney tends. The shadow of the tree falls against the open door, but is caught again on the side of the house, perpendicular to the point in which it meets the threshold. It is again lost under the eaves of the roof but if from the point J (a point in the wall level with the edge of the roof) a small line be drawn with a tendency from the *solar point*, the shadow of the tree may be again drawn from that point in which the edge of the roof is cut by such a line, (as in the point L.

The second compartment of this number contains various objects: let the shadow of the arch be first determined. The sun's place on the solar perpendicular is here marked $\left\{\begin{smallmatrix}\text{Sun b}\\2\end{smallmatrix}\right\}$ Take any points in the arch as X, Y, Z, and drop perpendiculars from them, as X B, Y A, Z C, and find the shadows of those lines, by the preceeding maxims. When the shadows rise into the interior of the arch, their true terminations can only be found by describing the sections which each plane of shadow would make within the arch; these planes of shadow would in that part be elliptical, and might be described by the directions given concerning plate 5; but such extreme accuracy will seldom be necessary in landscape drawing, although the trouble of it must be submitted to by the architectural draftsman.

The beam that overhangs the right hand building casts its shadow partly on the ridge of the building, partly on the body of the building, partly on the wall by the side of the arched entrance, and partly within the arched entrance. A little attention will shew that it forms an example belonging to the second case of maxim 2nd. The right lines that compose it are in planes parallel to the plane of the picture. A right line is therefore drawn from $\left\{\begin{smallmatrix}\text{Sun b}\\2\end{smallmatrix}\right\}$ parallel to those lines, which gives the point Va on the vertical line for the vanishing point of the shadow on the ridge and body of the building and on the interior part of the arched entrance. The shadow on the wall by the side of the building is parallel to its object, by maxim 2. The shadow of the ridge is determined on the same principles: draw A B from the corner A parallel to the horizontal line, and let it termi-

nate in the edge of the ridge: draw A C towards the point Va and let it be terminated by B C drawn towards the point $\left\{ {}^{\text{Sun b}}_{2} \right\}$; then C is in the edge of the shadow of the ridge which by maxim 2nd will tend towards C, the point of sight.

The shadows of the upright and horizontal paling will be easily understood by refering to the preceeding maxims.

(SHADOWS No 3. *The Sun before the Spectator.*)

In No. 3 the sun is supposed to be before the spectator, and the shadows will in every respect be determined by operations similar to those in the last examples, except that the sun is above the horizontal line instead of being below it, and that every line of shadow will tend *from* its vanishing point instead of *towards* it.

Having determined the solar point in the horizontal line, raise on it a perpendicular, and fix the point 3 *Sun*, which will denote the elevation of that luminary.

It would be impertinent and unnecessary to describe the operations for all the shadows in this example. They are determined according to the preceeding maxims; and therefore, those of the upright objects received on the ground or other level planes tend from the solar point The left side of the church tends to the vanishing point V1, and the shadows which are perpendicular to it, or (which is the same thing) of those which tend to V2, have their tendency from the point S1, where a ray drawn from V2 intersects the vanishing line of surfaces parallel to that side of the church; by maxim 1. The level style of the dial and the beam of the shed M will have the same tendency: the shadow of the oblique part of the style tends also from a point in the same vanishing line. The shadow of the shed on the church and on the ground will have various vanishing points according to the surfaces that receive it; all of which may be determined by the preceeding maxims.

The roof of the body of the church slopes with an elevation towards V3. Therefore its vanishing line being drawn will give S3 on the solar perpendicular for the point from which the shadows of perpendicular objects will be directed on the roof. The roof of the shed has the vanishing point of its sloping lines in V4, therefore by a similar operation the point S4 is found on the solar perpendicular for the shadows of upright lines or objects upon it.

The vanishing line of the hill passes through V5 and V2, therefore the edge of a ruler laid on V2 and V5 will give Sh on the solar perpendicular, for the tendency of the shadows of upright objects thereon. The shadow of the direction post is thus found; and that of the wall is drawn with a tendency to V5, by maxim 2.

Nothing remains here but what a little attention will better decypher than the most elaborate explanation would be able to teach. In the next plate, examples of shadows are given in the three different cases, and it will be useful for the student to copy them, as well as these, on a larger scale, attending to the angle of the sun in the first case, and the inclination of the objects that receive the shadow: and in the other cases, to the position of the solar point, and to the elevation of the sun, as well as to the planes or surfaces on which the shadows of the objects fall.

PLATE X.

SHADOWS.

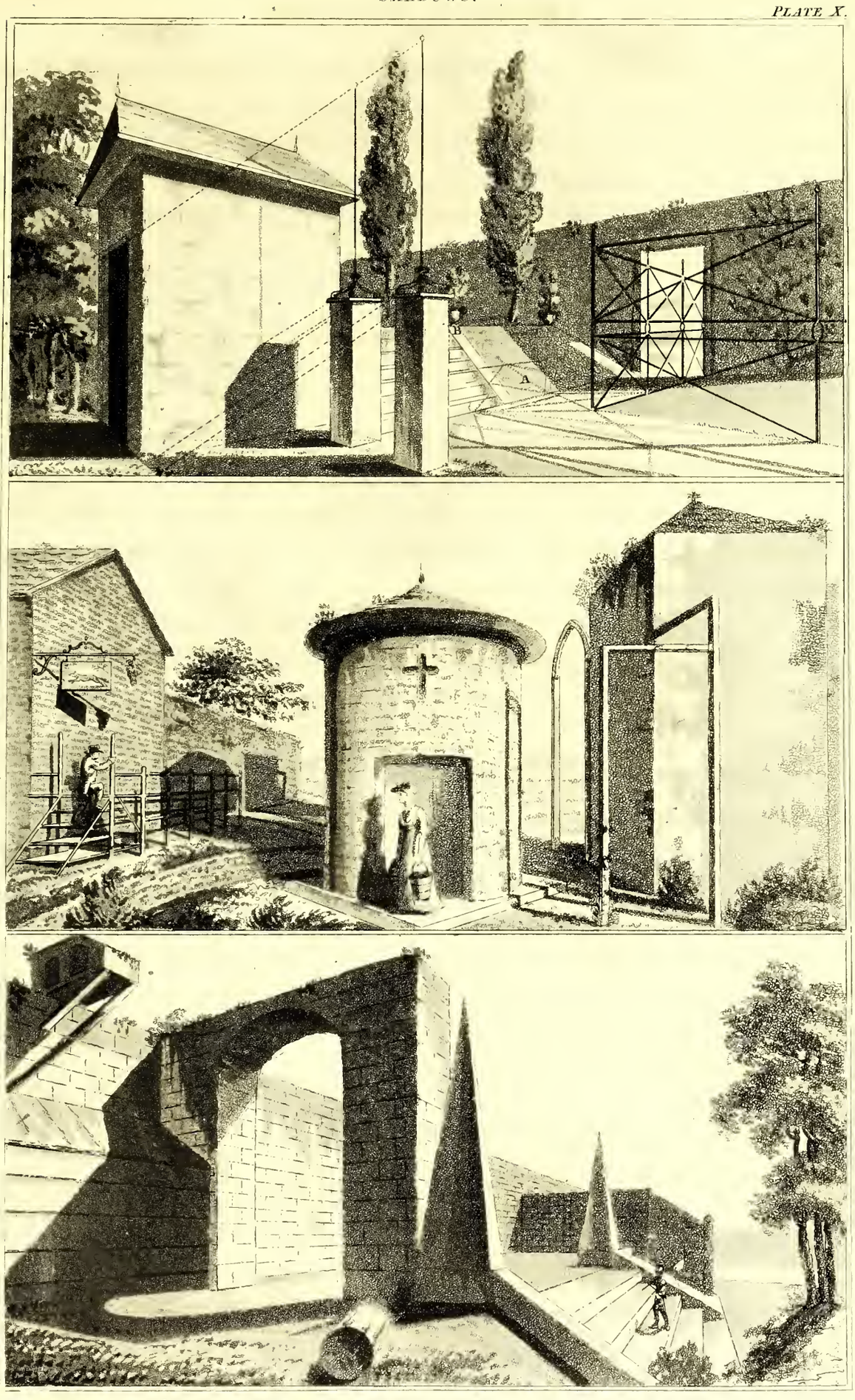
THIS plate contains three examples of shadows, according to the three different positions of the sun with respect to the picture.

In the first, the sun is in the plane of the picture, and his rays are therefore parallel to it. The shadow of the various objects fall parallel to the horizontal line, and are terminated by rays parallel to the angle of the sun's elevation, which may be known by any of the dotted rays in the example. From what has been said in the instructions given with the last plate, all the shadows in this example may be readily comprehended. I shall therefore only point out the shadow of the iron rail marked A, which falls upon the slope. A line parallel to the horizontal line is continued from the bottom of the rail (the middle of the three towards the garden gate) until it reaches the perpendicular back of the slope, and there a perpendicular is raised that gives the point B at the top of the slope, which will be the point to which the shadow of the rail tends on the slope. The student will recollect that it is upon the same principle that the shadow of the rod is obtained on the roof in No. 1 of the last plate. In the same manner is the shadow of the rod on the roof of the summer house in this example obtained.

In the second example the sun is behind the spectator, and the shadows tend to the solar point on the horizontal line, marked S P, and are terminated by rays drawn from the sun, marked Sun 1. Very few observations are here necessary after the instructions given in the last section.

The right hand old building is square, and the shadow of its farther side must be attended to, though it is not seen: an omission very frequently made in landscapes: by its shadow that of the old gothic arch is almost lost.

The shadow of the roof of the circular well-house, which falls mostly upon the well-house, will be best obtained by finding various points, by the terminations of the shadows of lines drawn under its ridge.



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Of the last example it need not only be observed that the sun is before the spectator, and very much elevated. The solar point is S P on the horizontal line, and the point of the sun is marked *Sun* 2. The shadow of the obelisk over the fallen pillar takes the curvature of the pillar. The shadow of the arch is obtained by finding the shadows of perpendicular lines drawn from points in the arch, as in the preceeding instructions.

To obtain every shadow perspectively would certainly be attended with considerable trouble, and it is not supposed that the artist will submit continually to such a tedious task. It is not required of him: the art, or rather the science of perspective, must be cultivated with such attention at first, by the landscape painter, that his judgment with respect to the form, dimensions, inclination and shadow of objects may be perfected, and then he will have no need to recur to the actual practice of it, except upon particular occasions. It is merely an introductory study: we cannot become acquainted with painting without its assistance, but when once introduced, we find other subjects more tasteful and more pleasing: yet, while engaged in the more agreeable labours of the pencil, we must carefully retain in mind the principles of perspective, and its rules must always be attended to, although they need not always be executed with the exactness of the ruler and compasses.

ESSAY

ESSAY

ON THE

APPLICATION OF THE PRINCIPLES OF

PERSPECTIVE,

TO THE PRACTICE OF

TAKING VIEWS.

THE chief charge which those, who object to the study of Perspective, adduce against this science, is the impossibility of performing its operations at the moment when those operations appear to be the most necessary; that is, at the time when an artist is *taking a view*. If Perspective had no fixed purpose but what depended on the compasses and ruler; nor any influence where actual measurement and determinate angles could not be obtained, it would indeed be a science worthy the architect alone; and its claims on the Landscape Painter, or on the pupil of refined taste, however just those claims might be, would be rendered nugatory by their impossibility. Nature has thrown a pleasing irregularity over all her works, and the pencil or pen, that presumes to describe her beauties, must not be trammelled by the formal precepts of pedants, however correct may be the proportions, to which they would reduce the exertions of practice. Nevertheless there exist certain laws which Nature ever observes: these may be subject to slight aberrations, but they still exist: it is the business of science to explain and render them

accessible to the artist; and the poet or painter, who rejects them, will be as liable to error although his errors may not be so glaring, as those of the mechanic or engineer. Those laws of Nature with which it behoves the Landscape painter to be particularly intimate are those of *Vision*.

To reduce the laws of Vision to the powers of the human understanding, it has been necessary to investigate them with mathematical accuracy: the construction of the eye; the motion, direction, reverberation, and composition of light; the proportion by which distance decreases the appearances of objects, and, in short, every thing which relates to the organs and faculties of sight has become the subject of separate research. Hence, from the certainty of a few general truths, the whole system of Nature's legislation, in the government of that most delightful of our senses, has been clearly explained. Perspective is but one part of that system, and its proportions, although they are the most extensive, may be esteemed as the most simple of the whole code.

Those, who made the rules of Perspective the objects of their study, set out with considering that any transparent plane (as the glass of a window) intercepting the rays of vision, becomes *a view* or picture of the objects behind it. As the eye remained unmoved they perceived that the landscape remained also unmoved on the surface of the transparent plane, which they termed the *plane of the picture*. To preserve this stillness of the objects, on the transparent plane, they perceived that the eye must be directed to one point, at a constant distance therefrom: this point they called the *point of sight*, and observing that it was in the intersection of that *level plane* with the plane of the picture, which extended to the boundaries of the *horizon*, they denominated that intersection the *horizontal line*. As all level planes appeared to incline, and at length to vanish, in the horizontal line, and as all right lines in a straight-forward direction appeared to converge, and, at length, to vanish into the point of sight, the first ideas of a vanishing line and point became obvious, as the guides to that position, in which the eye was to be preserved so as to retain *one view*, or *picture*, upon the transparent plane. The proportion in which the ray from the object to the eye was intercepted by the transparent plane was manifestly, that of the distance of the eye, to the distance of the object from the picture. Thus the first principles of the science were strictly deduced from the desire to *take a view;* or in other words to fix the appearance of objects upon a transparent plane.

The intersection of the horizontal plane with the surface of the glass, having thus determined the first vanishing line, with its central point and distance, other planes passing through the eye parallel to other plane surfaces might easily have been conceived; and thereby other vanishing lines, with their central points, might have been obtained: but the first writers on the subject were long contented with the horizontal line and the point of sight, by means of which any direct distance was easily determined. By supposing lines, parallel to the first distance of the horizontal line, to be drawn from any point in an original object, they obtained its representation by the simple process of dividing a line in two parts, proportional to two other lines: with this they were satisfied, or, at furthest, they found the vanishing points of oblique level lines in the horizontal line. The analogy between the horizontal plane and all other planes, whether vertical or inclined, was, however, no sooner explained by Dr. Brook Taylor, than the whole science became reduced to the utmost simplicity: and it seems astonishing to hear any one now discoursing on the difficulties of the *theory* of Perspective, when that theory is capable of being reduced to a single proposition.

When an artist has once imbibed a correct idea of this theory; when he comprehends that among the Perspective planes as they are exhibited in section the fourth, one has no vanishing line, but contains its objects in their original forms, while all the rest have vanishing lines, central points and distances, by which the appearance of any known dimensions or tendency may be determined by one easy operation, what is to hinder him from suffering his judgment to be directed by this knowledge, when he takes a view, where he cannot use his ruler and compasses? Will it not enable him to determine more readily the tendency of every line he has to draw? When the side or roof of a building, the rise or descent of a hill or bridge, the obliquity of a wall are the objects of his delineation, can he not, by imagining the direction of their vanishing lines, determine with greater facility the vanishing points of such lines as it may be necessary to draw upon such plane surfaces? The general landscape painter does not require the highest degree of accuracy in his sketches, but it is surely desirable that he should understand how to avoid any gross errors. Not only when his views consist of buildings, but even when the common objects of landcape scenery form the features of his design he ought to consult the theory, if he does not submit to the actual operations, of this science; and when he transfers his rough sketch to paper, or canvas, he must not be ashamed of borrowing assistance from the ruler, nor of considering attentively the direction of every vanishing line, and the seat of every vanishing point.

In taking a view it will be useful to draw a line across the paper for the horizontal line, before the artist begins his design. In the middle of the horizontal line the point of sight may also be determined, and the vertical line may be likewise drawn. Then if any buildings like those in PLATE I, the sides of which are perpendicular and parallel to the picture, are to be delineated, the vanishing point of level lines on the receding sides will be already determined since their vanishing point will be the point of sight. When the buildings are oblique to the picture as in PLATE II. one vanishing point may generally be determined with tolerable accuracy on the horizontal line, and the other may be easily found with the compasses and ruler, (the angle which the sides of the buildings make, with each other, being known) when a more correct sketch is to be made within doors: through those vanishing points, vanishing lines may be drawn; and the direction of parallel lines on such oblique planes may be corrected, if not determined, by the instruments. If the objects, or the ground on which they stand, should be inclined and sloping, as in PLATE III. and VI, it will be useful to determine the vanishing points, and even to trace the direction of the vanishing lines, if they are wholly oblique, particularly if the objects on such slopes should be numerous or prominent. All this may easily be done, and a little practice will render the eye accurate in determining a few vanishing points, while a hundred times that practice would not be able to render the artist only tolerably correct in sketching without those points, which will enable him to rectify any errors when he improves his sketch within doors.

It is not my business to interfere with the regulations of taste, or to offer any observations on what the subjects of views ought to be, or how the artist should choose his position in taking them. As far as fancy is concerned truth willingly yields the scene to her engaging pencil: she permits many irregularities of hills, of woods, of shadow and of artificial light to blend themselves under the hand of Genius, and to aid that general effect, which his creative energy alone knows how to produce. But Genius is not to destroy Nature: true Genius reveres her; and is the greatest when acting most comformably to her laws. The most beautiful pictures are those in which Nature has been most strictly followed; where the most regular delineations of Perspective, and the most correct outline of Shadow have been unerringly pursued; and where the artist has shown his Genius and created his effect, by choosing such a position of his perspective center, and of his light, as necessarily gave prominence and richness to his design, rather than by grouping the irregularities of uncertain delineation, and indefinable shadow, in the most glittering and brilliant disorder.

In determining his position the artist should be careful that his sight has sufficient scope to survey, at one glance, the whole of the intended subject of his pencil. The most interesting object should also have such a position with respect to the point of sight as may give it a clear and perspicuous appearance. No series of similar objects should recede too abruptly; and therefore, in views of regular buildings, the inclined representation should be chosen, where the oblique vanishing points may be at a considerable distance on each side of the point of sight. The picturesque nature of the surrounding country will indeed be the best guide for the tasteful judgment of the artist, and will induce him, to give such a position to his principal object, as may allow him, if possible, to introduce varieties of landscape to interrupt the uniformity of the architecture, with groups of trees or other natural scenery.

The height of the eye or of the horizontal line will naturally be the height of the eye of the person who takes the view. If in his delineations afterwards he shall, for the sake of giving more elevation to the low or depressed character of a level country, make his horizontal line still lower; or, that he may render the surrounding scenery of a mountainous country more expanded, elevate his horizontal line higher than its natural place, he must be careful to keep the true perspective position of his objects while he changes the delineation of each from its real appearance to the appearance he designs it to take. To diversify the position of the eye, in views, is always dangerous; and seldom produces the intended effect. It is only where the measurement of angles, and the geometrical accuracy of a plan, can be correctly obtained that the perspective of a view may be varied at pleasure: a labour after all, more adapted to the objects of the architectural draughtsman than to the landscape painter, who should generally adhere with precision to the appearance presented to his eye; and should study his effect rather from Nature than from art.

A scale accurate enough for the purposes of landscape painting may be obtained by measuring some certain object; as the height of a door, a post, or any thing else that presents itself in the picture, to which the artist can obtain access. By comparing the relative proportions which other objects bear to this and to each other, he will be able to determine their dimensions with tolerable precision. A few principal points may also be found by such instruments as the *Camera Obscura*, or by the *frame of squares*, which is formed with threads put across a frame, and fixed on a stand: in taking views of towns or considerable buildings the *Theodolite* also might be used with advantage. On the utility

of these helps I shall not pretend to insist: the eye by practice and by the assistance of the theory of Perspective, becomes capable of ascertaining these proportions with sufficient correctness; while the artist, at the same time, possesses in the actual practice of the science the means to prove, and rectify the whole of his delineations. When perfectly acquainted with the laws by which the dimensions of objects appear to be diminished in distance, he has only to suffer his judgment to be directed by them, and he will soon acknowledge that the guidance of scientific truth never checks nor contracts the exertions of true Genius, but informs it with those unerring principles which retain its course to the path of excellence.

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IN GENERAL;

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NOTE.—In Plate VIII, the letters which have a small mark under them, are referred to by Italics in the instructions; thus A is called *A*; B, *B*, &c.